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Functional Disorders of the Digestive Tract

J. Wendell Macleod, M.D.*

A discussion of "functional" gastro-intestinal questions is difficult to bring down to a factual, scientific basis. If there is any one reason more than another for gastroenterology as a field in medicine being regarded in many minds as little short of quackery, it is because of this group of so-called "functional" disorders. It includes not only perversions of physiological processes (e.g., motor or secretory) but also that motley assembly of patients whose gastro-intestinal symptoms are associated with anxiety states, obsessions, phobias and hysteria—in other words the psychoneurotics.

It is these patients who, more than any others, respond promptly to treatment that is imposed with enthusiasm and conviction, in the form of a well defined programme or routine. Whether the routine be semi-scientific or sheer witchcraft, the psychoneurotic is more likely to benefit from it than from isolated measures suggested impersonally and tentatively, even though derived from the soundest pharmacologic experience. This clinical fact is seldom appreciated by the laity and too frequently is overlooked by doctors when any special therapeutic measure is being appraised. Under these circumstances, it is no wonder that therapeutics in gastro-enterology is as confused and chaotic as it appears to be.

The confusing of fact and fiction in this particular medical field and its resultant atmosphere of a pseudo-science bordering on quackery can be overcome only by constantly striving to distinguish clearly the purely physiological mechanisms from those symptoms which arise primarily from the play of uncontrolled emotions and ideas. The growth of our understanding of the mode of interaction of these two mechanisms, the mind and the body as it were, does not exempt us from the necessity of **trying** to make this distinction in every case. The differentiation of these two types of "functional" disorder from the grosser tissue lesions has long been the goal in medical practice. Too often, however, the diagnosis of a "functional" malady has rested upon merely negative findings in physical and roentgenological examinations and the absence of a clinical history suggestive of "organic" disease.

In this paper it will be demonstrated, I hope, that certain sequences of symptoms are as suggestive in a positive way, of disordered function

of the digestive tract as is the history of rusty sputum following a chill and pain in the chest indicative of lobar pneumonia. Preoccupation with this thesis might lead to the neglect of searching for underlying or associated organic disease. This danger is minimized, however, if one understands the mechanism of production of symptoms in organic disease. They usually arise from an interference in function of organs rather than from the mere presence of the lesion in the organ. In other words, if one attempts to think of symptoms always in terms of disturbance of function, one will not overlook the possibility of tissue lesions in any case of symptoms suggesting disturbed function.

When gastro-intestinal symptoms cannot be attributed to ulceration, new growth, gall stones, etcetera, it is desirable to attempt to classify them etiologically according to one or another of the following functional reactions:

1. The Reaction of the "Situational" Disturbance:

The sailor who vomits only in the roughest weather is one example. Another, common in any diagnostic clinic, is the patient whose diarrhoea is due to the taking of a daily cathartic whether he needs it or not; also the constipation of travelling. Such a person gets well as soon as the precipitating or "situational" factor is removed.

2. The Reaction of Constitutional Autonomic Imbalance:

This is illustrated by the sailor who is unquestionably well-motivated but has always been subject to motion sickness and who is seasick in quiet waters when there is the slightest roll. His counterpart in practice is the person who has a tendency to either constipation or diarrhoea when tired or under stress or when excited in either a happy or unhappy way. He may sweat easily, exhibit tremor when in a hurry and his voice may tremble or his knees shake when he speaks in public. In spite of these symptoms, however, he has a healthy attitude towards his life in contrast to the next reaction group.

3. The Reaction of Psychoneurosis.

To carry the analogy along, this is represented by the sailor whose seasickness is really homesickness or a fear of submarines; or he is the patient whose diarrhoea is a somatic expression of his inability to face difficult situations in his work, home or emotional life.

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Any two or all three of these reactions may be combined in the same person, and when there is an associated organic lesion as well, it can indeed be a four-square dilemma.

This suggests, then, that very few gastro-intestinal symptoms are, of themselves, indicative of specific basic causes, and I plan to remind you later that even such a syndrome as right upper quadrant pain, belching and intolerance of greasy foods is not diagnostic of a particular disease nor indicative of disease in a particular organ.

Let us turn now to consideration of several of the more important symptoms. Only a few are chosen because I wish to devote most of my time to the management of functional colon disorders, as we see them in office practice.

Gas Belching

This is not only one of the commonest of complaints, but also one of the most distressing. Sometimes the patient has in mind the distress which the belch relieves, but more often the complaint is based on fear, depending on misunderstanding of the significance of belching. (What is more horrible to contemplate than the picture of one's stomach having turned into a "gas factory"! Or, the fragrance of fried onion in a belch three or four hours after a meal must surely mean that the stomach cannot digest that onion; it **must** be a diseased stomach!)

The swallowing of a certain amount of air along with food or drink is, of course, unavoidable. Moreover, the less one masticates and the more rapidly one swallows, the more air there will be in the stomach's "air bubble". In the ordinary course of events, pressures are equalized by two means—the relaxation, or reduction in tonus, of the gastric wall and the belching of some of the swallowed air.

An increase in belching will follow, therefore, when more air is swallowed and when the gastric musculature resists stretching. Both of these factors are present in the person whom we shall designate, for brevity's sake, as "nervous." He gulps his food down and his gastro-intestinal tract, in whole or in part, may exhibit varying degrees of hypertonicity. This hypertonicity (with which may be associated also hyperperistalsis and hypo-secretion) may be mediated through the vagus nerves from the mid-brain. Indeed, this is believed to occur in all cases of active duodenal ulcer and in many cases of gastric ulcer. In gastric ulcer, and in the genuine types of gastritis, the hypertonicity probably depends mainly upon local reflex stimuli from the lesion in the gastric wall; while in gall bladder disease it is probably a matter of reflex effect from disease in a nearby and neurologically related viscus. Were there time, I believe I could convince you that the frequent

hyperacidity in gall bladder disease is due to these motor changes rather than to any alteration in gastric secretion.

Whenever a patient's belching recurs every few minutes or seconds for a period of time—anywhere from a few minutes to several hours—one can be quite sure that he is an air swallower. This means that air is aspirated back into the stomach at the completion of a belch before the various sphincters have closed again. It is hard to do this if one belches with the mouth open, and usually during the interview the patient gives a demonstration of attempting to suppress a belch with his fingers re-enforcing a tightly closed mouth. At other times, he is seen to swallow air in a forced, though usually quite involuntary manner. (The possible role of oral eroticism in some cases, I shall not attempt to discuss.)

What are the results of air swallowing? Quite apart from misapprehension of its significance, it may cause pain high in the epigastrium, sometimes extending across the lower ribs to the axillae, or up into the neck. Palpitation, or increased awareness of heart action, may be present, especially if there is elevation of the left leaf of the diaphragm. The latter process may cause a peculiar type of dysphagia—arrest of food in the oesophagus until a forced inspiration brings down the diaphragm and permits egress of oesophageal contents through the cramped hiatus.

Treatment may require direction along the following lines:

(a) Convincing the patient that all his "gas" is swallowed air.

(b) Persuading him to chew well and swallow in a leisurely manner. As one might guess, this often involves an attempt at correction of his whole mode of living, sometimes including his code of etiquette!

"Better to belch and bear the blame,
Than squelch the belch and bear the pain."

(c) In cyclic belching, when the reflux of air back into the stomach cannot be controlled, it often helps to have the patient insert a rubber eraser or cork between the teeth in order to learn the art of belching with the mouth freely open.

(d) In resistant cases, it may be necessary to insert a tube.

The latter measure is often essential when cyclic belching complicates a gastric ulcer or the post-operative course.

To summarize then, severe belching indicates no specific process of disease and no specific organ involvement. It usually implies a two-fold disorder of function—excessive air-swallowing and a heightened tonus in one or more segments of the gastro-intestinal tract. In this manner, belching

may occur in ulcer, cancer, gall stones, appendicitis, constipation, cathartic diarrhoea; in many disorders of the heart and of the nervous system, as well as in amateur dramatics and the more robust sports of the corner tavern.

Heartburn

This is chosen for brief discussion because it represents a disorder of function of the oesophagus. It is often thought to arise from regurgitation of acid chyme from the stomach; however, it can occur in the pernicious anaemia patient with achylia and in the pregnant woman with low or absent acid. It is reproduced accurately by distending the lower oesophagus with a balloon, and its presence clinically is conceived by most students to indicate a state of neuro-muscular hypertonus in the lower third of the oesophagus, including perhaps, also the cardiac sphincter. As such, it may result from an irritative lesion in the oesophagus itself (such as alcoholic oesophagitis and peptic ulcer), or it may be simply one of several manifestations of a more generalized hypertonicity. When heartburn is also present in a patient with the so-called irritable colon syndrome, one is inclined to suspect a generalized rather than local disturbance of function, e.g., a tendency to imbalance, in the autonomic regulation of digestive tract function, rather than one of the "situational" disturbances mentioned.

Hunger Pain

A gnawing epigastric discomfort, relieved by food, is conventionally taught to suggest a mucosal erosion in the stomach or duodenum. Yet how often we fail to find a lesion by X-ray or gastro-scope! It is clear that this syndrome may be present in ulcer patients long before the ulcer is recognizable, as well as in other individuals who never develop ulcer. Time does not permit me to set forth the evidence, but there is good reason to believe that rhythmical hunger distress is the subjective manifestation not of a particular tissue lesion but of a disturbed physiological state—namely, hypertonicity, usually in a secretory as well as in a motor sense. This is the perversion of function that leads to peptic digestion of mucous membrane at certain vulnerable sites. Whether

the development of the erosion of itself leads to an additional pain-producing mechanism—is not clear. The appearance of pain when a previously silent gastric neoplasm undergoes ulceration would argue for this.

In the case of duodenal ulcer the physiological perversion (hypertonicity, hyperperistalsis, hypermotility, hypersecretion) seems to be present as a rhythmically recurring constitutional tendency, and this is of some help in differential diagnosis. The ulcer candidate's remissions usually are fairly complete and last weeks, months or years. When the bout appears, the hunger pain is usually present daily and tends to appear more than once a day. On the other hand, when this "hyperacidity mechanism" is the result of reflex effects from an actively diseased gall bladder or appendix or salpinx, it exhibits no such periodicity. It may be present daily, or every other day, or only once a week. Hunger pain present daily for years, without remission, usually suggests a constitutional autonomic imbalance or a psychoneurosis, often both. Night pain, awakening one from sleep, usually indicates the development of ulceration. It is associated with an increase in amount of nocturnal gastric secretion, which in the presence of a defective neutralizing mechanism has a highly acid titre. The height of acid titre and the length of time of contact with sensitized tissue seem to be two of the factors determining the time of appearance of ulcer pain. The third is the factor of abnormal muscle tonus, which by itself may cause distress not only in any part of the gastro-intestinal tract, but also in any hollow viscus or tube in the body possessing walls of smooth muscle.

The role of the vagus nerves and their hypothalamic connections, in these symptom mechanisms, is not only fascinating for speculation but carries important implications in both pharmacologic and operative therapy. It is a subject worthy of our special attention on another occasion.

(The second section of this paper, dealing with functional disorders of the colon, will appear in another issue.)



*Urologic Studies in Chronic Abdominal Pain

J. L. Wiseman, M.Sc. (Med.), M.D.

Pain is the common denominator in most abdominal lesions, and is certainly the most common complaint for which the patient seeks relief. The location of the pain, its character, and its relation to points of tenderness have clinical significance, but are seldom pathognomonic. Pain is usually the manifestation of obstruction, distension, inflammation, torsion, or perforation.

As a rule intense abdominal pain of sudden onset offers few diagnostic difficulties. The majority of these abdominal crises are the end-results of chronic pathological process which have probably given other evidences of their presence for a more or less prolonged period. Confronted with the possible existence of an apparently acute intra-abdominal lesion as manifested by sudden intense pain, localized muscular rigidity, gastro-intestinal upset, leucocytosis, etc., the decision to explore the abdomen is certainly warranted. As in any problem of diagnosis, care must be exercised in obtaining an accurate history, which alone will often lead to a correct solution of the problem. There are, however, cases in which the diagnosis cannot so readily be made. For example, the differentiation between acute appendicitis and acute pyelitis may present a difficult problem, if the urine shows red cells and a few pus cells, acute pain and tenderness over McBurney's point, and definite leucocytosis—all in the absence of a clear-cut history of previous urinary tract infection. In a small number of cases, an error in diagnosis may possibly occur when the appendix is retro-caecal or retro-colic, in which case the pain may simulate that of ureteral colic, but unless there have been previous attacks there will be no abnormal cells in the urine.

This paper, however, is primarily concerned with the differential diagnostic problems presented by chronic abdominal pain. Inasmuch as there is here no acute problem demanding immediate solution, time is available and should be taken to establish a correct diagnosis and so spare the patient an operation which may fail to remove the cause of the pain from which the patient seeks relief.

Before we consider the sources of diagnostic error, let us briefly review the subject of abdominal pain, and so determine why confusion arises. The abdominal viscera are supplied by the sympathetic system, the fibres of which do not transmit the sensation of pain. When distension occurs as the result of inflammation, obstruction,

or torsion, the capsules or coverings of the viscera become stretched and this leads to painful stimuli which are transmitted to the spinal cord segments with which these sympathetic fibres or the ganglia are associated. The sensation of pain is then interpreted as originating in the area supplied by the spinal nerves of the affected segment. Confusion as to the precise localization of pain can be accounted for by the fact that there is an overlapping of the sensory segments in the spinal cord, so that pain sensations arising from widely separated viscera may have similar localization or close resemblance. The kidney, ureter, bile ducts, liver, spleen, appendix, uterus, fallopian tubes, ureter and testicles have numerous terminations in the 9th, 10th, 11th, 12th dorsal, and 1st lumbar segments, and pain resulting from disease in any one of these organs may simulate pain usually regarded as characteristic of any of the others. Many localized pains are made easier of interpretation by having more or less characteristic modes of radiation, which are often typical of cord propagation—e.g., the pain in the testicle or down the ureter, in renal colic. The same holds true for radiation of pain to the region of the scapula in biliary colic.

Renal pain is of two types—capsular and pelvic; but in all cases with pain originating in the renal pelvis from obstruction, there is pain also from the resulting distension of the pelvis which leads to capsular stretching. On the other hand, an abnormality of the renal cortex or its environs may lead to pain unassociated with obstruction of the renal pelvis or ureter. Clinically, dull lumbar pain or ache is presumably of capsular origin. This occurs in solitary cysts and in polycystic kidneys, in hydronephrosis and in cortical tumors of the kidneys during the transitional stage of encapsulation. Pronounced tenderness in the costo-vertebral angle after firm percussion is highly suggestive of capsular distension. However, fixed renal pain must not be confused with lumbago; it must also be differentiated from the pain of arthritis, aneurysm, ankylosing spinal lesion such as osteomyelitis, tumor of the spinal cord, or the prolapse of the nuclear pulp. The characteristic pain radiation referred to as "renal colic" is presumably of pelvic or upper ureteral origin.

It is my purpose to direct your attention to the diagnostic problems presented by obstructive lesions involving the upper urinary tract, especially those associated with **negative urinary findings during intervals**, and which closely mimic lesions of the gastro-intestinal tract—duodenum, gas-

*Read at monthly meeting of Simon Flexner Club, Feb. 19, 1946.

bladder, appendix and colon. Inflammatory lesions of the kidney, whether non-specific or tuberculous, and advanced destructive lesions resulting from calculus formation are as a rule associated with pronounced disturbances of urination,—such as frequency, urgency, strangury due to secondary cystitis, and the appearance of blood and pus in the urine,—so that the physician's attention is soon attracted to the urinary tract, and no diagnostic problem exists.

It is important to bear in mind that a very large number of urinary abnormalities and diseases present no such localizing symptoms. The clinical manifestations of the obstructive renal syndrome may be primarily of the gastrointestinal type—nausea, vomiting, possibly colicky pain in the epigastrium or upper abdominal quadrant,—with **urinary disturbances inconspicuous and not infrequently totally lacking.**

I propose to deal with some of the sources of error in diagnosis, to stress the importance of thorough urologic investigation, and to present some of the pitfalls which have to be circumvented in arriving at a correct diagnosis.

In the presence of chronic abdominal disease with ill-defined symptomatology, a thorough and searching urological study employing all diagnostic facilities is certainly to be desired before subjecting the patient to what may prove to be a hazardous or ill-advised operation. As previously outlined, the differentiation between lesions of the urinary tract and the appendix, during an acute attack, should be relatively simple, and yet Barney reports that in 15% to 20% of patients in whom lesions of the kidneys or ureter had been revealed, previous operations had been performed without relief. The late Charles Mayo in one of his reflective moods stated bluntly that practically every patient who came under his observation for the study and treatment of right-sided ureteral calculus had previously had an appendectomy. My limited experience will not permit of such an unqualified statement, but I can recall on more than one occasion being called in to see a patient suffering from right-sided ureteral colic, while still convalescing from an appendectomy. These remarks are not meant in any way to be derogatory of the surgeons' diagnostic acumen, but they serve to emphasize the fact that even localized pain may be very deceptive. It is possible to understand the patient's reluctance to submit to cystoscopic study in all cases of chronic abdominal pain, and I am not suggesting this course, but certainly in all borderline cases the patient should at least have the benefit of radiographic study. **The urinary findings particularly during the interval between attacks of acute pain may be essentially negative,** although in my experience with calculus in the upper urinary tract a few

red cells are found on microscopic examination of urine, on more than one occasion. Here we are presented with the first possible source of error in diagnosis. The so-called asymptomatic or "silent calculus" is comparatively rare, but its true incidence cannot be definitely established because many fail of detection due to inadequate investigation, or faulty interpretation. Casual elimination of the urinary tract as a factor in explanation of the patient's symptoms should not be based on the examination of a "flat plate" of the abdomen. The preliminary exposure or "scout film" of the kidney, ureter, and bladder regions, henceforth referred to as K.U.B. plate, employing the Bucky diaphragm, should form part of every routine X-ray study of the abdomen. In failing to do this considerable delay may result. Technical flaws, foreign bodies in the intestine, calcified glands, phleboliths visualized in the X-ray plates, unless readily excluded, may necessitate intravenous or retrograde pyelography to determine their true status.

With intravenous urography, bilateral absence of visualization is indicative of advanced renal insufficiency. The failure of one kidney to visualize is suggestive of renal pathology but does not imply a functionless kidney—sudden impaction of a calculus in the lower ureter may lead to temporary renal inhibition and resultant failure to visualize.

A satisfactory K.U.B. plate should be of sufficient contrast and clarity to show the kidney shadow, the lateral border of the psoas muscle, and of course the entire tract from the lower costal margin to the symphysis pubis. At this point I wish to point out another error which is sometimes committed. After a barium series has been reported as negative, a search is then made of the urinary tract as a possible explanation of the abdominal pain. In these days of limited hospital accommodation several days' delay may result before the barium is completely eliminated and therefore before satisfactory plates of the urinary tract may be made. The reverse procedure is the one to be adopted—examination of the urinary tract followed by the barium meal—then certainly no shadows suggestive of calculi will be overlooked. The radiological findings of an opaque shadow, in the region of the kidney or along the anatomical course of the ureter, is merely presumptive evidence that there is a stone in the urinary tract. This emphasizes another pitfall in interpretation. Certainly no surgeon is justified in exploring the kidney or ureter on this evidence alone. The inclusion of the opaque shadow in the intravenous pyelogram is corroborative, but not conclusive. Retrograde pyelography employing the procedure of shift shadowgraph and lateral pyelograms, especially if the shadow is small and

concentric, should be resorted to in order definitely to localize its position. An opaque shadow which lies well anterior to the ventral surface of the vertebrae does not lie within the renal pelvis.

At this point it might be well, before proceeding to the next condition—which may be confused with intra-abdominal disease—to point out yet another possible source of error in diagnostic interpretation. Only about 50% to 60% of supposedly “renal colics” can be attributed to renal or ureteral calculus. In the absence of a definite opaque shadow on the roentgenogram, renal colic has often been erroneously attributed to the descent of a non-opaque uric-acid or other non-calcareous stone, although this does occur possibly in about 5% of cases. The majority of “renal colics,” when properly investigated, will be found to be the result of spasm induced by the passage of blood or blood-clot from a nephritic, hydronephritic or neoplastic kidney. Twists, kinks and angulations of the ureter due to pressure of tumors, with or without concomitant excessive renal ptosis are responsible for colicky pain. These remarks serve to emphasize the danger inherent in the casual elimination of the urinary tract on the presumptive evidence of the absence of an opaque shadow in the radiogram.

The problems of differential diagnosis between lesions of the gall bladder and the right kidney have been greatly simplified since the introduction of cholecystography. The combined use of cholecystography and intravenous urography serves in many instances to differentiate lesions in the right upper quadrant. It must be borne in mind, however, that due to the predominantly cholesterol content of gall stones, their visualization by radiological means, unless as negative shadows in the cholecystogram, is highly unsatisfactory. Where no shadow is obtained after the oral administration of dye, it does not necessarily follow that the gall bladder is the seat of pathology, since something may have interfered with the absorption and subsequent elimination of the dye. It has been estimated that the accuracy of cholecystography is about 85%. Gall stones are found in approximately 15% of normally visualizing gall bladders. It is not my purpose to discuss in detail the relative merits and deficiencies of this radiological procedure. In a small group of cases the patient has a lesion both of the gall bladder and of the right kidney, and it may be difficult to determine which of the two is responsible for the pain. A thorough urological investigation is often called for in order to determine which problem is the more pressing, so that appropriate steps may be instituted for its correction.

The clinical recognition of the early manifestations of pathological disorders of the urinary

tract has been made possible and continues to be enhanced by improvements in diagnostic accuracy. The introduction of intravenous or excretory urography has proven of inestimable value both as a test of renal function, and to a limited extent, for visualization of the urinary tract. Its widespread use in clinical study has revealed many abnormalities and pathological processes in their incipency. However, indications for its application in chronic abdominal pain have been overlooked to some degree. Ferris and Counsellor, in a recent review of the Genito-Urinary Surgery for 1945 performed at the Mayo Clinic, report that 50% of cases of hydronephrosis required nephrectomy, whereas this procedure was only resorted to in 33% for nephrolithiasis (renal stone). According to Hinman, there are no definite symptoms associated with hydronephrosis which develops as a result of ureteral obstruction. This obstruction is occasioned by stricture, either intrinsic or periureteral, by congenital valves or aberrant vessels to the lower pole of the kidney, and by high insertion of the ureter in the renal pelvis. The sole manifestation of the obstructive renal syndrome may be the occurrence of gastrointestinal upset, nausea, vomiting, diarrhoea, possibly colicky pain or a dull dragging ache in the loin or upper abdomen. The renal pain ascribed to distension and the development of an early hydronephrosis is characterized by being inconstant. It is of a dull aching nature during the intervals between attacks, but during an exacerbation corresponding to obstruction at the uretero-pelvic juncture, it may become colicky and display a tendency to radiate either towards the mid-line or into the groin on the same side, although in a manner less typical than that experienced with the migration of a urinary calculus. The location of the pain is variable, and though it is most frequently experienced in the ilio-costal space, it may be felt in either hypochondrium, iliac or lumbar regions, or in the neighborhood of the umbilicus. Its tendency to recurrence and periodicity, uninfluenced by the ingestion of food or the assumption of the recumbent position and the coincident appearance of a palpable tumor in either flank during the attack, or possibly in the interval,—whose size on repeated occasions may have been found to vary,—is highly suggestive of hydronephrosis, particularly when it occurs in a patient **during adolescence or early adult life**. And yet these symptoms are not infrequently misinterpreted so that the patient is often submitted to a series of needless operations. Braasch states that 44% had previous laparotomies of one type or another before the true cause was revealed.

The recognition of obstruction at the uretero-pelvic junction at this stage with operative correction will spare the kidney. **In a large number**

of congenital hydronephroses, the symptoms are predominantly of the gastro-intestinal type with no urinary symptoms and negative urinary findings, particularly so during the interval between attacks.

It was the disparity between the early detection of hydronephrosis and the poor results following plastic procedures, requiring subsequent nephrectomy, which prompted Henline to re-examine the possible causes of uretero-pelvic obstructions. He concluded that intrinsic stenosis, alone or in combination with anomalous vessels to the lower pole, was responsible for the largest number, and that unless both factors were corrected poor functional results invariably followed.

When a palpable tumor is discovered during the course of physical examination, or hematuria occurs, the kidney is as a rule beyond plastic repair and nothing short of nephrectomy will suffice.

Hunner states that "if we except the relatively small proportion of congenital anomalies leading to urinary leakage, we find that most patients with congenital anomalies, if they reach the urologist, do so not because of this malformation but because they have been unfortunate enough to develop an ureteral obstruction which has given rise to renal stasis with its various end-result,—hydronephrosis, infection, calculus formation. These ureteral obstructions are most often caused by stricture." I recall very vividly receiving a long personal communication from Dr. Hunner shortly after the publication of my paper in 1934 on the obstructive renal syndrome relating to congenital anomalies, drawing my attention to the probability that acquired ureteral stricture was responsible in a number of cases. I will deal more fully with this shortly.

At present I am interested in presenting to you some of the findings in a fairly large series of cases such as that presented by Dees. He reported 135 congenital anomalies of the upper urinary tract in 1,410 unselected hospital admissions, as determined by intravenous and retrograde studies, an incidence of 9.6%. His investigation was made to determine primarily the incidence of anomalies in unselected patients; the relationship between their incidence and the patients' complaints, either directly, or as a predisposing factor in the acquisition of secondary infection, calculus formation and obstruction; how often these complications occur; and the number that remain asymptomatic. Minor embryological variations such as bifid pelvis, foetal types, and anomalies secondary to anomalies of the lower tract, such as valves in the posterior urethra, were not included. In 100 cases or 74.7% the anomaly was the underlying cause of the complaint, and in

84 of these the outstanding symptom was pain. In 25 patients (18.5%) there were no symptoms directly or indirectly referable to the anomaly, i.e., they were asymptomatic. Abdominal pain unassociated with infection, and calculus formation was present in 16 patients (20%), and if we add to these, the cases in which hydronephrosis alone was revealed without secondary complication, we find that approximately **45% with negative urinary findings would readily have been missed had not their presence been revealed by urologic studies.**

Congenital anomalies of the upper urinary tract are many and varied, both as regards size, number, position, and degree. Emerson Smith has reported 471 congenital anomalies in 18,460 hospital admissions. In his series pain was the outstanding complaint in 78.9%, and gastro-intestinal symptoms predominated in 32.4%. In my 15 years experience as a urologist I have encountered practically all these anomalies with the exception of the solitary ectopic kidney. It has been my impression that pain, particularly during the early stages of obstruction is the outstanding symptom, and if its true origin is recognized early many kidneys could be saved by conservative treatment.

The diagnosis of duplication of the renal pelvis and ureter, is as a rule made quite readily by intravenous urography or by cystoscope. If on cystoscopic examination one finds duplication of the ureteral orifice on one or both sides the diagnosis is obvious, but when there is only one ureteral orifice there may still be bifurcation at some point above the bladder. An associated pathological condition responsible for a non-functioning segment of duplicated kidney should be suspected by the following radiological signs: (1) An elongated renal shadow in the K.U.B. plate; (2) the presence of a large portion of the renal shadow with no visible means of drainage as demonstrated either by intravenous or retrograde methods; and (3) abnormal configuration of the renal pelvis.

It is true that, in a small number of cases, anomalies revealed by intravenous urography during the course of routine examination may have no clinical significance, i.e., they are asymptomatic, but the patient should always be advised of their existence.

With solitary cyst of the kidney, and polycystic disease, pain in the loin may be the presenting complaint. In the normally placed organ, tumor in the loin when renal in origin, usually lies high in the upper quadrant. In patients of average build it appears as a mass which can be felt by bimanual examination, which does not move with respiration, which unless unusually large can be made to disappear

under the costal margin; and which can be felt by ballotment, unless the tumor is fixed.

The value of urologic study in cases of chronic abdominal pain associated with palpable tumors in the abdomen, by intravenous and retrograde methods is self-evident. A normal pyelogram excludes the urinary tract as the source of pain and origin of mass. A markedly displaced normal pyelogram, possibly with angulation and deflection of the ureter, suggests retro-peritoneal masses either sarcoma, carcinoma of the colon, or large cysts. Barium studies may be utilized to advantage at this point to supplement pyelographic studies. The kidney may be displaced either in a vertical or in a lateral plane dependant upon the origin of the mass. A marked distortion of the normal pelvic outline—sometimes referred to as the dragon-like deformity—is suggestive of polycystic formation. Renal tumors may be associated with localized elongation of minor calyces or filling defect, depending on the position of the tumor. At other times the pelvis may be completely filled by tumor. It is important to bear in mind that the classical clinical triad of pain, tumor, and hematuria is indicative of an advanced stage of malignancy. Quite apart from the subject under discussion, I wish to repeat the urologist's plea for the early investigation of painless gross hematuria. The tendency to prescribe for this condition without ascertaining its pathology and site of origin has retarded the diagnosis of neoplasms of the urinary tract for months and even years. When the patient eventually submits to urologic investigation the malignancy has advanced so far that nothing but temporary procedures are possible.

The following conditions, although not exclusively confined to the female sex, occur predominantly in women, particularly those in the child-bearing age—20 to 40 years. The effects of torsion of the ureter and renal vessels have already been briefly referred to as a possible source of error in the "acute abdomen." We are chiefly concerned, however, with the more prevalent form in which the patient, usually a woman, complains of a dull dragging ache in the loin. It is not uncommon for these women to be regarded as neurotics, or they may be treated for peptic ulcer or atonic dyspepsia for a long time, before routine abdominal examination reveals a freely movable kidney. In such cases the pain is relieved by recumbency, bears no relation to meals, and vomiting when it occurs is only brought on by pain, and does not relieve it. It is important to remember that the same patient may have movable kidney and also peptic ulcer, or atonic dyspepsia, the latter being an accompaniment of a general visceroptosis. This type of patient is usually irritable, restless, and tires easily; her

chest is usually long and flat with a narrow sub-costal angle; the lumbar spine is straight, the waist narrow, and the abdominal muscles flabby. Palpation of the kidney in this asthenic type with the patient in the upright position, gives a ready clue as to the origin of pain and the concomitant gastro-intestinal symptoms. This should be corroborated by pyelograms taken both in the recumbent and erect positions to determine the degree of mobility and whether the condition is uni- or bilateral. The right kidney is the one most frequently affected. If the condition is bilateral it is important to determine whether or not it is part and parcel of a general visceroptosis. The position of the transverse colon after a barium meal taken in the erect position will determine this. The disfavour which has beset fixation operations has been the result of many factors, the most important of which has been that proper patients have not been selected for this operation—making the operation fit the patient is of paramount importance.

The anatomical course of the ureter through the female pelvis and its relations to the pelvic organs renders it very vulnerable to inflammatory and other changes of the internal genitalia. The ureter may be compressed, stretched or distorted by uterine fibroids or cysts in the broad ligament. It may be strangulated by scar tissue following gynecological operations or as a result of pelvic cellulitis. It may be compressed by malignant growths, or occluded by ill-placed ligatures. The result of obstruction is dilatation of the ureter and eventually of the kidney proper. The early symptom is pain sometimes of an acute character resembling colic but more frequently of a dull aching nature during the intervals between attacks.

The problems presented in differential diagnosis are of interest both for the gynecologist and the urologist. It is important to bear in mind that the patient may have urinary symptoms which are often erroneously attributed to pelvic disease. On the other hand, symptoms attributed to the urinary tract may be due to a lesion in the pelvis. A complete urological survey, and a thorough gynecological examination, is indicated in all border-line cases in which diagnosis cannot be readily arrived at.

It is the consensus of opinion amongst urologists that congenital or acquired intrinsic strictures of the ureter exist at the upper and lower ends of the ureter, i.e., the uretero-pelvic and the uretero-vesical junctures, leading to obstruction with ensuing hydro-ureter and hydronephrosis. There is, however, much less agreement on the prevalence of acquired intrinsic strictures of large calibre in the lower or pelvic segment, resulting from foci of infection or adjoining pelvic inflam-

mation. Hunner states in describing the symptoms which are attributed to ureteral stricture—sometimes referred to as “spastic ureteritis”—that “to attempt to draw a pain chart of the affliction one would need a diagram of the human frame extending from the diaphragm to the ankles, the most deeply shaded portion of which would centre in the broad ligament.” I have already referred to his contention that congenital anomalies become clinically apparent as a result of an acquired stricture. Some years ago at the suggestion of Hunner, whose integrity as a crusading urologist I have never doubted, I armed myself with bee’s wax and a spatula and became fairly proficient in moulding quite acceptable wax bulbs on stiff ureteral catheters. My experience with this method of diagnosis of ureteral strictures was not very encouraging. The patient’s post-cystoscopic reaction to withdrawal of large bulbs usually was pain exceeding in severity that for which he originally sought relief. I concluded that it was a procedure par excellence for alienating patients rather than winning their confidence. The procedure is also fraught with danger such as breakage of the catheter and ureteral rupture. No spinal or intravenous anaesthetic is used, since the diagnosis depends on the reproduction of pain. It is my conviction that intravenous urography is a much more acceptable procedure, particularly with improved technique—Trendelenburg position with supra-pubic pressure and subsequent films in the erect position to determine the emptying

rate of the renal pelvis. I have had no experience with rapid serial pyeloureterography. Nevertheless, in spite of these differences of opinion, patients complaining of pain which may simulate renal colic, but more frequently with **vague abdominal pain and gastro-intestinal disorders with negative urinary findings**, should be investigated urologically before ureteral stricture is discounted. It is my practice, whenever indicated, to probe the ureter with large ureteral catheters or those of the Garceau type. I have encountered few true ureteral strictures of the acquired type by this method—these have responded well to dilatation.

To Sum Up

1. It is important to remember that a “negative urine” does not eliminate the urinary tract as the origin of chronic abdominal pain.
2. The classical clinical picture of renal colic does not necessarily mean that the patient harbours a calculus.
3. A thorough urological survey is indicated in all border-line cases of chronic abdominal pain in which the diagnosis cannot be readily made by other means.
4. It is important to bear in mind that a very large number of urinary anomalies and diseases present no localizing symptoms.
5. A careful history and physical examination, and in women pelvic search for cause of abdominal pain, is a pre-requisite.



Hemorrhage in Pregnancy*

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As it is generally accepted that between 15% to 20% of all pregnancies terminate before the foetus is viable, I would like to deal with that problem first.

For purposes of treatment the following classification is useful:

- I. Threatened
- II. Habitual
- III. Inevitable—(a) complete
 (b) incomplete
 - i. septic
 - ii. non-septic
- IV. Missed
- V. Therapeutic

Threatened Abortion

Here one can find that even where there is both some bleeding and pain, one may still succeed in arresting the process. Essential factors in the treatment here are absolute rest, sedatives, such as morphia, demerol, bromides and barbiturate. Corpus luteum extract is definitely a help.

It may be administered orally and (or) only intramuscularly. I can see no advantage in having the foot of the bed elevated.

In the so-called **habitual type of abortion** one should be careful to exclude any obvious pathological condition, before classifying condition as of the so-called idiopathic type.

Corpus luteum extract is a deserving standby for this condition and should be given both orally and parenterally. Recent reports in the literature indicate the prolonged use of corpus luteum extract will result in the pregnancy continuing beyond the expected date and the foetus becoming unusually large; that has not been our experience. Coitus must be specifically forbidden and at least a partial bed regime instituted.

For the **inevitable type of abortion in any of its forms** where hemorrhage is severe enough to endanger the patient's life uterus must be emptied. All the auxiliary means such as blood transfusions must be carried out at the same time. One should remember that the newer ergot preparation—ergonovine—is much more efficient than the older forms.

For the **inevitable complete abortion** the same routine as in a full term post-partum normal case is to be followed. For the inevitable incomplete

type, the treatment depends as to whether it is the septic or the non-septic type.

In the septic type of abortion it is generally agreed that the conservative approach will be safest. The patient must be kept at absolute rest and both the sulfa and penicillin products pushed hard. Fowler's position to be resorted to; transfusions, etc., may also be required. It is well to note here that penicillin may now be given orally.

In the inevitable incomplete non-septic type some difference of opinion even locally is present as to the treatment. I, for one, honestly believe that a carefully carried out evacuation of the uterine contents—using a dull spoon curette or an ovum forceps—gives quite satisfactory results. One may perhaps give the patient the benefit of a two day trial of medical treatment by the use of quinine and whiskey.

Vesicular Mole (Hydatidiform)

The specific etiology here is still unknown. We do know that there is a superabundance of prolan in the blood in these cases.

As far as the treatment of these cases is concerned, considerable difference of opinion still prevails—chiefly as to whether hysterectomy should be carried out. Personally I have had at least two cases that proved conservative treatment justifiable. These particular cases were followed by subsequent full term normal pregnancies.

When the Asheim-Zondek test with its modifications appeared it was looked upon as a sure guide as to whether chorionepithelioma is developing following hydatidiform mole expulsion. Recently some doubt is shown as to the absolute infallibility of this test in this connection. There have been definite cases of chorion-epithelioma reported where the biological tests were negative.

Many authors still prefer to leave the uterus because while it is true that perhaps as many as 50% of chorionepitheliomas follow vesicular mole, it is well to remember the total number of chorionepitheliomas is quite small.

Carcinoma of the Cervix and Pregnancy

Remember to make a speculum examination in all cases of recurrent vaginal bleeding even during pregnancy: Where carcinoma of the cervix is definitely present, if pregnancy is beyond the fifth month the danger that radiation treatment to the child may cause abnormality is small. My own experience of one case when the mother was almost at full term when first seen was that a normal child was delivered. In spite of heavy

*This paper and case were presented at the St. Boniface Hospital Session of the short post-graduate course offered by the Faculty of Medicine of the University of Manitoba during March, 1946.

radium and X-ray therapy the mother died shortly after.

As soon as the foetus is viable a classical Caesarian section with appropriate radium and X-ray treatments to follow seems to be the favored procedure according to literature.

Ectopic Gestation

One point in the diagnosis to remember is that the mass we look for is often behind the fundus—that is in the Pouch of Douglas and not necessarily to either side of the uterus. Posterior colpotomy to help in the diagnosis of doubtful cases has its advocates. Personally I try to avoid it.

The Ascheim-Zondek test or its modifications do not help much here as it is positive in only about 50% of the cases.

Unless extra-uterine pregnancy can be definitely carried out, laparotomy must be carried out. In cases of a ruptured ectopic, emergency surgery is to be resorted to. The patient must first receive the appropriate treatment for shock. Here do not be tempted to correct other pathological conditions found in the abdomen at the same time, as the mortality and morbidity will be definitely increased where such a procedure is adopted.

Placenta praevia may be defined as a condition when the placenta borders upon, partly or completely covers the os, or to word it slightly differently, when the placenta is implanted partly or wholly outside the active segment of the uterus.

We have been taught that in cases of placenta praevia haemorrhage is usually painless. That is true in most cases, but there is no doubt that at least in some of the cases pain is definitely present.

It is well to remember, too, that this condition can and does occur in primiparas.

The treatment, even if one does perhaps risk repeating the most elementary rules, resolves itself to the following important points:

First of all, if a hospital is at all available that is the place to have the patient, for as you know an apparently very mild case may suddenly bleed so profusely as to definitely endanger the life of the patient. It is better not to do rectal examinations. Make provision for blood transfusion. Of course now that the Red Cross is assuming the responsibility of supplying blood, I should think that there will be blood available at all times, even in the most remote parts of the province; otherwise of course provision must be made for donors and of course we all know by now that the Rh factor must be taken into consideration when testing for the suitability of the blood.

In the central placenta praevia if there is still any hope for the foetus to survive, Caesarian section is the treatment. For other forms of placenta praevia the tendency now is not quite as

definite for abdominal delivery as it was only two or three years back. The use of the "bag" is no longer as popular nor is Braxton Hicks version. Willet's clamp in the cephalic presentation has its advocates; but from a review of the literature and from one's own experience, Caesarian section is safest both for the mother and child. Where the hospital facilities are not available then rupture of membranes and the Braxton Hicks manoeuvre should be resorted to where it is apparent that rapid delivery cannot be executed otherwise. In a recent article Macafee of Belfast in a series of 174 cases, Caesarian section was done in 68.

In cases of placenta ablatio (abruptio) or that misfit term "accidental haemorrhage" several factors must be considered: 1st, at what stage of pregnancy this has occurred, and 2nd, the severity. Toxicosis is still generally accepted as the principal aetiological factor, in cases of ablatio placenta.

In accidental haemorrhage where it is definitely the external type and not severe, rupturing the membranes and perhaps assisting labor by administering small doses of pitocin—2 min.—at half hour intervals for about six doses and allowing labor to proceed in a normal way would seem rational. One of course assumes that there are no other untoward factors involved. Where cervix fails to dilate and haemorrhage is severe, Caesarian section is generally favored. Where the type encountered is of the concealed variety, treatment of shock must precede the Caesarian section that is to be carried out. Here a hysterectomy need not be the routine as suggested in some articles. Blood transfusions can be given at the time of the operation or shortly thereafter.

In the cases of the combined type of haemorrhage the conduct of the case should be the same as for the purely concealed variety.

Case Report

Mrs. B., age 40, was admitted to the St. Boniface Hospital on March 11th at 5 a.m. She is Gravida xi Para viii. Last menstrual period was Sept. 1st to 5th, making her about 25 weeks pregnant. On admission she was bleeding profusely, and obviously had already lost considerable blood. The haemoglobin was only 15 per cent. The abdomen was tense, uterus extremely tender. A diagnosis of ablatio placentae of the combined variety was made. Foetal heart sounds could not be heard. Urinalysis showed presence of albumen and many casts.

She was given a transfusion of 500 cc. of whole blood; another 250 cc. was given at 1.30 p.m.

Because the cervix showed only a slight dilatation and the uterine bleeding continued, the

only hope for saving the mother's life appeared to indicate delivery by Caesarian section.

This was done at 4.30 p.m., which was the earliest I felt her condition permitted major surgery. Cyclopropane and oxygen anaesthesia was administered by Dr. Marjorie Bennett. The foetus was dead. The uterine cavity was found filled with blood clots. The placenta was in the fundal part of the uterus, and was detached

over a considerable area, and showed several areas of necrosis.

The substance of the uterine wall showed a cotton wool appearance over a small part of the area involved. I felt that hysterectomy was not called for.

After a rather stormy three days—post-operative—the patient made an excellent recovery and was able to leave the hospital on the fourteenth day.

Carcinoma of the Body of the Pancreas—A Case Report

A. T. Gowron, M.D.

Carcinoma of the pancreas constitutes about 1.5% of all malignancies. It occurs in the head of the gland five or six times more often than in the body or tail. It is some say four, and others say seven, times more common in men. Cancer in the body of the pancreas in a woman may therefore be considered as definitely uncommon.

The patient was a 55 year old Ukrainian woman who, previous to November, 1945, had suffered only from mild but widespread joint pains. Early in November she began to have loose stools, the number varying from two to ten or more. She felt full and uncomfortable but scarcely had pain. Along with the diarrhoea came weakness and loss of weight, the latter amounting to 88 pounds (almost exactly half of her usual 175) by the beginning of March, when she first sought advice. She had no other significant symptoms. On examination the woman was seen to be extremely emaciated. Her colour was muddy and the skin was dry, harsh and in loose folds. The peripheral vessels were very firm and the blood pressure was 160/98. The joints showed chronic thickenings. Otherwise the physical findings were not noteworthy. The abdomen could easily be examined but no masses were felt.

In hospital certain laboratory investigations were made. The blood showed 4,600,000 red cells and 7,000 normally formed and normally distributed white cells. The haemoglobin was 60%. The Wasserman Reaction was negative. The fasting blood sugar was 280 mg. per 100 cc. and a sugar tolerance test showed a maintained level of 340 mg. The urine showed sugar, the percentage varying from 1 to 2.8. The stool, which was bulky, showed on examination total fats 58% with great increase in neutral fat. There were no ova or parasites. Gastric analysis revealed the presence of free hydrochloric acid and absence of blood and lactic acid. An unsuccessful attempt was made to obtain the duodenal contents. X-ray examination of the alimentary canal was negative.

There was a strong suspicion that malignancy was present but this could not be confirmed. All

the evidence pointed to the pancreas as the site of disease and, in the absence of a palpable mass, chronic pancreatitis was the diagnosis accepted. This would explain the abnormal stools, the bowel looseness and the associated diabetes. Fibrotic changes in the pancreas if sufficiently severe can interfere profoundly with the mechanisms of both internal and external secretion. The failure to absorb nourishment was held to be the cause of the emaciation. The anorexia and asthenia were attributed in part to associated vitamin lack. She was given a low-fat diet with insulin to improve the metabolism of the carbohydrates. Pancreatin was administered before each meal. She also received about twice the normal daily requirement of the principal vitamins and in addition B complex was given parenterally. On this line of treatment she seemed to improve a little for a few days but a decline speedily set in and she died about four weeks from the time that she sought advice. During the last few days she showed a little jaundice.

At autopsy four-fifths of the distal portion of the pancreas was found to be destroyed or replaced by a firm cancerous mass which had completely spared the head but which was firmly adherent to the stomach and posterior wall of the abdomen. The root of the mesentery had been invaded and the small bowel was a dark reddish-blue. Secondary growths were found in the liver.

The ante-mortem diagnosis—chronic pancreatitis—was, of course, wrong; but it is interesting to compare the symptoms presented in this case with those commonly ascribed to cancer of the body of the pancreas and to chronic pancreatitis. In cancer of the body of the pancreas the most common symptom is pain which is described as dull, aching, and usually constant. Constipation and loss of weight, according to McGavack, "are seen in all cases of carcinoma of the pancreas irrespective of its location." He also says "Ascites is one of the most striking features of cancer of the body and tail, and occurs in more than

two-thirds of cases." "Haematemesis and melena occur in half the cases of cancer of the body and tail but rarely in cancer of the head of the pancreas."

The symptoms of chronic pancreatitis are frequently difficult to distinguish from those of chronic cholecystitis which is itself associated with pancreatic changes in a quarter of the cases. Typically the onset is insidious with loss of appetite and a distaste for fat and meat. The stools are large, bulky and frequent, and contain large quantities of unsaponified fat and undigested muscle-fibres.

Glycosuria indicates involvement of the islets. Jaundice will appear if the common duct is involved. On the whole the symptoms indicate

the site rather than the nature of the process.

In this case there were none of the cardinal symptoms of cancer. There were also no suggestions as to the source of an infection which might cause chronic inflammatory changes. Among the rare causes of chronic pancreatitis is arteriosclerotic change leading to fibrosis, and this was thought of as possible if not probable. There was no remedy for this patient when she was first seen but had she sought advice earlier it would have been proper and, perhaps, life-saving to have explored the abdomen. When there is strong reason to believe malignancy is present and the seat of the symptoms is clear it is wiser to subject the patient to the risk of an operation than to the greater danger of delay.

Book Review

Pathology in Surgery. By Nathan Chandler Foot, A.B., M.D., Professor of Surgical Pathology, Cornell University Medical College, Surgical Pathologist, New York Hospital, with 368 illustrations in black and white and 20 colored plates. Montreal: J. B. Lippincott Co. Ltd. \$10.00.

This book has been written for the surgeon and deals essentially with the pathology of those disorders which are treated surgically by extirpation or are investigated by biopsy. The author feels that safe and good surgery requires an adequate knowledge of the special pathology of surgical disorders. This is something apart from general pathology, cannot easily be gained from text books on general pathology but is very necessary for the surgeon. Dr. Foot has for a number of years given this instruction at Cornell University and the present volume is an extension and amplification of his lectures. Because the book is practical, theoretical discussion is avoided. It does not aim at comprehensiveness. The every day conditions are considered fully and adequate space is given to the less common diseases; but conditions that seldom come under the care of the general surgeon receive either brief mention or none at all.

The earlier chapters deal with general pathological processes, such as inflammation, the healing of wounds, and tumors. There is a chapter of special interest to hospital surgical pathologists in which technical matters are discussed. The rest of the book is arranged by systems, all being included and adequate space being given to each. There are useful sections on the bone marrow and on the skin. Ovarian tumors are discussed under the classification of Barzilai. Chronic lymphoid appendicitis is recognized and discussed. There is a section on the cardiovascular system which, however, confines itself largely to arterial and

venous diseases. Throughout the book clinical notes and methods of treatment are introduced when these are likely to assist the surgeon-reader. The work is based on a long and large experience and some dogmatism is to be expected but the opinions of many authorities are quoted.

The style is precise and clear. The arrangement of the letter press into parallel columns makes for easy reading. There are 368 well chosen illustrations which are excellent and 10 plates in color. There is a 20-page index and a selected bibliography follows each chapter.

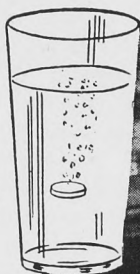
J. B.

American College of Surgeons

1946 Clinical Congress

The American College of Surgeons announces that arrangements have been completed for the holding of its Thirty-second Clinical Congress at the Waldorf-Astoria, New York, September 9 to 13 inclusive. Plans include the usual extensive program of demonstrations, scientific sessions, panel discussions, symposia, forums, Hospital Standardization Conference, medical motion pictures, business meetings, and educational and technical exhibits, which will be held in the headquarters hotel, and operative and non-operative clinics in the local hospitals.

This will be the first Clinical Congress since the meeting in Boston in 1941. Since that time, 2,744 surgeons have been received into fellowship in absentia, and to them in particular the Convocation on the opening night of the Congress will be a long anticipated event. Many of these new Fellows will have recently returned from service with the armed forces. The formal initiation ceremonies, always impressive, will be exceptionally so this year because of the large number of new Fellows admitted during the past four years who are expected to be present.



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Section of Anaesthesiology

P. C. Lund, M.D., Anaesthetist, Deer Lodge Hospital

Abstracts

Resuscitation

R. L. Gorrell, M.D., Clarion, Iowa

The saving of life is the most important and most satisfying of the physician's duties. Every physician regardless of his specialty sooner or later finds himself in an emergency situation where immediate action must be taken to save a life. He must know how to carry out this procedure himself and must not depend on a voluntary rescue squad, fire department, or other lay group.

Our record in the past has not been too good. I have seen a physician stop a well-trained team who was carrying out artificial respiration in the proper manner merely to give a stimulant hypodermically. Even if the stimulant were to be dramatically effective and research indicates that very few are, it would need to be given intravenously.

The technique used is less important than the determination of the physician and his assistants to stay with attempted resuscitation for a minimum of several hours. The simplest technique over a long period of time is Eve's Rocking Method; until a board or door can be obtained on which to rock the patient, he may be tilted by two men or may be treated by the Schaefer method.

In a recent symposium in Clinical Medicine it was agreed by the anesthetists consulted that in the operating room the use of oxygen breathing bag, and face mask, was very effective. The bag is compressed rhythmically by the hand and the mask held snugly against the face, thus inflating the lungs.

Often minute details are exaggerated. For example, most laymen and many physicians feel that artificial respiration must be given at precisely regular intervals. It is true that a regular rhythm should be adopted, but not to the point of burdensome intricate counting, and of neglecting the patient's first attempts at respiration.

The simplest method is mouth to mouth breathing. This may be used when the patient is lying on his back. For some reason physicians seem to be concerned about the possibility of introducing bacteria into the respiratory tract. They overlook the fact that all of us are continually inhaling contaminated air. It is more important that the patient be alive and in possession of a few organisms than to be dead from a sterile procedure.

In such an emergency the establishment of the heart function is brought about through the

restoration of breathing. This is due in the first place to persistence of the heart beat long after respiration has ceased. Secondly, there are few effective cardiac stimulants. Thirdly, it is much easier to restore respiration. Fourthly, changes in intrathoracic pressure increase the volume of blood returning to the heart, thus indirectly stimulating it.

On one occasion an obese woman was undergoing an abdominal operation under spinal anesthesia, when respiration and circulation stopped suddenly. The nurse was instructed to grasp the tongue and hold it out of the throat. One of the surgeons rhythmically compressed the chest wall, while the other squeezed the heart between one hand on the precordium and the other up against the diaphragm. Within a minute the patient was breathing normally and the heart had resumed beating.

On a number of occasions it has been necessary to interrupt procedures or deliveries to employ artificial respiration for a few moments. Some surgeons are reluctant to contaminate their sterile gloves and gowns, and thus delay a few moments of time precious to the patient, while a nurse or intern is attempting to compress the chest. I believe that every physician should fight for his patient's life, and not give up the struggle until every resource has been exhausted. I believe that every physician should know a few simple methods that can be applied anywhere, and have the initiative to step in, the knowledge to care for an emergency, and the determination to play the game to the end.

P. C. L.

Lundy, J. S.: Endotracheal or Intratracheal Anesthesia. *S. Clin. North America*, Mayo Clinic Number 795-833 (Aug.) 1945.

"The endotracheal or intratracheal method of anesthesia has become one of the most valuable methods for increasing the number of cases in which use of inhalation anesthetic agents is satisfactory, for carrying out artificial respiration and for facilitating drainage of the lung . . . An intratracheal tube provides (1) a means of introducing an adequate dose of the anesthetic agent more easily, (2) an unobstructed operative field, (3) placid and adequate respiration, (4) an effective means for carrying out artificial respiration, (5) a means for preventing aspiration of foreign material and (6) a respiratory stimulant . . . For the ordinary patient a greater volume of anesthetic agent is inhaled into the lungs with a given muscular effort when the Magill intratracheal tube is used than when it is not used . . ."

"An intratracheal tube can be introduced into the trachea and connected to the gas machine or to another device for administering an anesthetic agent by inhalation . . . If the patient's respirations can be made placid without the use of an overdose of anesthetic agent, the appearance of cyanosis, evidence of oxygen want or the excessive accumulation of carbon dioxide, then conditions become relatively satisfactory to the surgeon and anesthetist. This condition of placid respiration with adequate ventilation is usually accomplished by the use of an intratracheal tube. This is particularly true of those patients who have short, fat necks and thick tongues and of whom it usually can be predicted beforehand that they should be anesthetized through an intratracheal tube."

"In some instances the patient is greatly benefited by artificial respiration accomplished by manual compression of the bag, administering oxygen when respiration is unsatisfactory, especially if there is evidence of marked shock."

If severe convulsions occur in the course of general anesthesia and a barbiturate is not available for their control, artificial respiration can be carried on through the intratracheal tube until some means can be found to control them. The intratracheal tube lying as a foreign body in the trachea in many cases seems to act as a respiratory stimulant. It has seemed so to me in cases in which the effect from preliminary medicaments, especially morphine, is unusually marked. In those cases respiration is usually quiet during induction and inadequate when the stage of surgical anesthesia is reached.

The intratracheal tube has a special advantage for operations on the brain, face and neck. It is also valuable for patients who are to have intrathoracic operations for which the means must be at hand to control intrathoracic pressure.

It is important in operations on the thyroid gland when the trachea is compressed before operation. It is important in many operations in which the general anesthesia is used and the patient has bilateral paralysis of the vocal cords before the operation. It is important in operations on the stomach since pyloric obstruction may result in regurgitation of gastric contents into the throat with aspiration into the trachea. This regurgitation can be minimized or eliminated by use of a well-fitting intratracheal tube. In any operation in which the occasion may arise to aspirate material from the lung, an intratracheal tube makes it easy for the anesthetist to use a suction catheter through the intratracheal tube. For the patient who is to have an operation on his back the position is one that makes it difficult for the anesthetist to administer an inhalation anesthetic and so the use of an intratracheal tube

usually is indicated for such operations. For operations for lesions of the large bowel an intratracheal tube makes it possible for the anesthetist to maintain a smooth anesthesia and to produce quiet respiration. Both are highly desirable in handling lesions of the large bowel as straining on the part of the patient may contribute to post-operative peritonitis in these cases.

"For the operations that may be associated with considerable loss of blood in a certain percentage of cases, such as splenectomy, craniotomy, or radical amputation of the breast, the use of an intratracheal tube and the placid respiration which results from its use often will permit completion of the operation without the need for transfusion. There are operations such as resection of the sensory root of the trigeminal nerve in which any bleeding into the wound interferes with the operation. Use of an intratracheal tube reduces the amount of bleeding in these cases when the operation is performed with the aid of inhalation anesthesia."

From time to time the anesthetist may be faced with a situation that has not been recognized pre-operatively, namely, fixation of the vocal cords. In such cases respiration will be inadequate to ventilate the lungs properly until an intratracheal tube is introduced. In a very rare instance the epiglottis will fall over the glottis with each inspiration and will be blown away with each exhalation. Under these circumstances, conditions soon become grave but it can be corrected by the use of an intratracheal tube.

"A patient who suffers from angina pectoris may require operation. If the attacks are frequent and severe and inhalation anesthesia is to be used, I have felt safer with an intratracheal tube in place than without it. This is especially true when the anginal attacks occur during the operation and it is necessary from time to time to administer sufficient oxygen to keep the color satisfactory."

Although most patients respond relatively satisfactorily to the use of an intratracheal tube, from the standpoint of correcting difficulties of respiration, there are some who, in spite of the tube, do not do well.

In some cases of acute infection of the upper part of the respiratory tract use of an intratracheal tube is probably not advisable. There is a type of patient who cannot tolerate any trauma to the mucous membranes. In one such case I observed tracheitis after the use of an intratracheal tube and urethritis after catheterization in the postoperative period.

Phonation indicates that the vocal cords are together. Expiratory phonation indicates that the cords are together on expiration. Inspiratory phonation indicates that the cords are together

on inspiration. The tube should be passed during the phase of respiration when phonation is absent.

The technic of introducing the Magill intratracheal tube varies with circumstances under which it is to be used. If it is to be passed through the nose by Magill's method of so-called blind intubation, the throat should be sprayed before induction of general anesthesia with a surface anesthetic solution. Usually, general anesthesia is induced either intravenously or by inhalation before insertion of the tube, but the rectal method may be used.

When an intratracheal tube is to be introduced into the trachea of a patient who is anesthetized with a weak anesthetic agent, such as nitrous oxide and oxygen or pentothal sodium, two aids should be used: (1) the throat and larynx should be sprayed with a local anesthetic solution, and (2) a mouth prop (DePass) should be used to separate the teeth on the left side before anesthesia is induced.

Since anesthetic agents for intravenous anesthesia have rapidly become generally available, intratracheal tubes probably will be introduced under intravenous anesthesia more and more commonly; however, special precautions must be taken as pharyngeal and laryngeal reflexes remain relatively active.

When ether is to be given by the open drop method through the intratracheal tube, the external end of the tube must not extend far enough out of the nose or mouth so that the lumen will be partially occluded or covered by the mask or gauze on the ether mask. Unless tubes are cut to suit a given patient, the tube may be so long that it extends beyond the trachea and into the right or left bronchus. If respiration is not satisfactory, that is, if it is too slow or jerky or if the patient is slightly cyanotic when breathing air, respiration can be improved by the partial withdrawal of the tube so that the beveled end is above the bifurcation of the trachea.

If the tube cannot be inserted into the trachea but it can be inserted into the esophagus, an airway may thus be provided that is better than no artificial airway for the patient may be able to breathe along the outside of the tube. I have used this procedure only once and then only until anesthesia became deep. In those cases in which a mild anesthetic agent is used the introduction of a relatively small tube is easier than the introduction of a larger size tube. If a tube does not fit snugly enough to exclude air on inspiration when the pressure in the breathing bag is low (2 mm. of mercury), then a larger flow of gas and more pressure (5 to 6 mm.) in the bag will overcome this difficulty. However, the pressure

in the bag at the height of expiration should not be greater than 12 mm. of mercury.

When the endotracheal tube has entered the trachea, if the patient is in a light plane of anesthesia, coughing usually takes place as long as the tube moves within the trachea. It is important to immobilize the tube if coughing is to be minimized.

The tube introduced through the mouth is less likely than the nasal tube to be inserted too far into the trachea, and during or at the end of operation it is much easier to insert a soft, urethral type of suction catheter through the former. If an intratracheal tube has been placed by way of the nose, a small, semistiff, silk woven catheter which must be well greased before it will follow the curve of the intracheal tube often is required for aspiration. For best results, special catheters are needed; these should be 6 inches (15 cm.) longer than urethral catheters and made of a stiffer material; for example, woven silk catheter (14F.) with an angular finger valve. If a special catheter is not available, then an extension tube or something else must be devised for the ordinary urethral catheter so that it can be made long enough to reach the location desired.

During or at the end of operation it may be necessary to carry out aspiration from the tracheo-bronchial tree even though the intratracheal tube has not been used. This can be accomplished by using a laryngoscope, a semi-stiff catheter and suction. If the patient has a full set of teeth and the teeth cannot be separated because of ankylosis of the jaws, the only way in which the tube can be introduced is by blind intubation through the nose. In these cases it is most important to use preliminary medication and to spray the throat thoroughly with a solution of a local anesthetic agent by way of the nose.

When the teeth can be fairly well separated but still not enough so that a regular laryngoscope blade can be introduced over the central incisors and the glottis brought into view, the full size blade of the laryngoscope can be introduced from the side of the mouth and the glottis can be visualized. Introduction of the laryngoscope from this angle is also valuable for the patient who has prominent upper central incisors. In some cases the tube can be inserted through the lumen of the blade. In some cases if several adjacent teeth are missing, the blade of the laryngoscope, if a small one is used, can be placed in the space between the teeth and the tube can be inserted through the lumen of the blade.

Whenever a patient who has a tracheotomy opening must be anesthetized, an intratracheal tube large enough to fill the opening is selected.

Pentothal sodium given intravenously can be used to make the introduction of the tube easy

and to keep the patient quiet while anesthesia is being induced by the inhalation method. For application of a head, neck and body cast with the intratracheal tube in place, a second tube can be attached to the external end of the first tube and by means of an adapter and inhaler tubing it is connected to the gas machine. An intratracheal tube connected in this manner permits the anesthetist to get back out of the surgeon's way and expedites the application of the cast.

The embryologic development of the child must be taken into consideration whenever intratracheal anesthesia is contemplated for a child ten years of age or less. Since the head is larger in proportion to the neck and the neck is larger in proportion to the chest, a tube that can be introduced through the nose may not enter the larynx and one that can be introduced into the larynx may not enter the trachea at all.

It thus may be possible to introduce the tube through the nose of the child, but if it does not enter the trachea after one or two attempts, the laryngoscope should be used and the tube inserted under direct vision through the mouth. If, after one attempt, it does not enter the trachea, a smaller tube should be used so that the glottis will not be traumatized. The tube must be small enough so that it will enter the glottis and trachea without force. A Magill tube that fits the glottis and trachea of an infant tightly may cause edema which is undesirable, and which may end fatally. Epistaxis or bleeding from the throat of a child or infant may be easily produced by trauma from the tube.

An intratracheal tube is usually contraindicated for a child that is one year or less of age because a tube that can be inserted into a tiny trachea does not have large enough lumen to provide easy respiration for an infant. Trauma from the end of the intratracheal tube to an infantile glottis may easily produce edema which will entirely obstruct respiration postoperatively; this may require tracheotomy which may be followed by pneumonia and death. When an intratracheal tube must be used for a child or infant, it is best to use Ayre's technic as modified and described by Adams.

Complication of intratracheal anesthesia are due principally either to the trauma of introducing the tube into some part of the respiratory tract which is not patent enough to accept it without injury to the tissue, or to compression of the tube

during anesthesia. The latter makes the method hazardous.

The commonest symptom observed in the course of passage of a tube through the nose is bleeding. In my experience I have not seen serious untoward results from nasal bleeding. In a rare case the surface of one or both vocal cords is traumatized and a small blister or hematoma appears, which is usually associated with hoarseness. Occasionally when this has happened the patient has complained for months after operation of hoarseness and on examination a small lesion (granuloma) has been found on one or both vocal cords. In the few cases in which I have observed this result the oral surgeon has treated the lesion successfully with a protected diathermy needle. Whether or not the tube caused the lesion cannot be determined with any certainty since contact granulomas have been found in cases in which an intratracheal tube has not been used. Trauma to the teeth may occur from the use of the laryngoscope for oral intubation, especially when there has been dental repair or when such repair is needed. The lips may be pinched between the teeth and the laryngoscope. The use of some protective device for the teeth is desirable. The tongue seldom gives trouble. The epiglottis, however, may be bent and traumatized by the end of the laryngoscope.

Unless the mucus or foreign material that gathers or becomes lodged in the lumen of the tube is removed, it will complicate use of the tube.

The time that the tube lies in the trachea and larynx is usually relatively short. However, in an occasional case I have had to insert a tube and leave it in place for a number of hours. I have seen an untoward result only once when the tube was left in place for fifteen hours or less. Artificial respiration is seldom continued for more than twenty hours because of the futility of anticipating a recovery in such a case.

A lesion causing respiratory paralysis that does not respond to treatment within twenty hours may be considered fatal although in some instances I have carried on mechanical artificial respiration with the intratracheal tube until the heart stopped even though I was not hopeful of a satisfactory outcome.

Complications can be prevented to a large extent if the anesthetist will take precautions against contamination and employ the measures that are advocated for the purpose of making the introduction of the tube relatively easy. P. C. L.



Editorial

J. C. Hossack, M.D., C.M. (Man.), Editor

A Committee on Public Relations

A matter which should be brought before the forthcoming Convention is the need for a Committee on Public Relations. From time to time we read in the lay press letters and speeches in which the profession is condemned for what it is or is not doing or has or has not done. Usually the facts are distorted and very often the blame is laid where it should not be placed. Nearly always these little Joves hurl their thunderbolts at the "Medical Association" and nearly always the Manitoba Medical Association has had nothing to do with the matter.

The most recent example is to be found in The Toronto Saturday Night of April 20, 1946, where, under the caption of an article written by a local clergyman, we find the following printed in bold type:

Since this story was written it has become practically certain that the eminent refugee with whom it deals will be compelled to leave Manitoba. The Manitoba Medical Association is insisting on a full year's internship, an impossible demand for a married man with family. Saskatchewan makes more flexible arrangements, and will probably gain what Manitoba will lose.

It is obvious that the writer of the article had not bothered to ascertain the facts. Our Association has nothing to do with licensure or conditions of practice. But to the layman all organized bodies of medical men are included in the word "Association."

There are two ways of dealing with such matters. One is to ignore, the other is to answer them. In the opinion of the layman to ignore is to admit that the statements are true. It is very much better to answer. But to formulate the proper answer requires consultation with the body concerned because the Association as such is practically never concerned. Therefore it would seem desirable to have a representative from each of the organized medical bodies sit together as a committee of which the duty would be to correct wrong impressions and oppose wild statements with actual facts.

This Committee could serve another useful function. During the Convention, unless things have changed, the newspapers will want their reporters admitted to our meetings for the purpose of publishing what they regard as good "news stories." To be sure they want to do it nicely and are glad of guidance in what they prepare but this does not alter the fact that their presence

at our sessions is neither necessary nor desirable. Yet it is exceedingly important that the public should be kept aware of what we are doing not just during a few days in the year but all the time. A Public Relations Committee could be of great value in bringing before the people in a proper way these medical matters that concern them. The time has passed when with Olympic aloofness we could shrug our shoulders at what people said about us. Doctors as a body have never been popular with the laity whose attitude from time immemorial has been one of dislike and distrust. We are ourselves convinced of our integrity and worthiness but we must convince the people also that we have these qualities.

The Mystery of Mr. Pinkham

In moments of relaxation I occasionally meditate upon the greater and lesser mysteries of life, among the least of the latter being the mystery of Mr. Pinkham. There must, I reason, have been a Mr. Pinkham for how otherwise could there have been a Mrs. Pinkham? And the aforesaid Mr. Pinkham must have predeceased the aforementioned Mrs. Pinkham for how otherwise could there have been a Widow Pinkham? But who was Mr. Pinkham? Considering how much we know about Lydia it is remarkable that we are so ignorant about Percy. Indeed I am not even sure that his first name was Percy but Percy (or Percival) Pinkham is a cognomen both alliterative and euphonious and, as we must have some way of designating him, we shall use the name Percy for that purpose.

The circumstances under which Percy wooed and won his Lydia are unknown to us. We are certain only of the facts that "To the nuptial bower he led her, blushing like the morn," and that, for some reasons best known to herself, Lydia developed a keen interest in the physiological irregularities of her neighbours. This interest, at first purely neighbourly, became practical and finally commercial when she found that she had concocted the nicest little pelvis-tidier-upper that any mortal had yet managed to coax into a bottle. Those were the days when it was a "cure". It circulated through those regions modestly referred to in Victorian times as the "body" or "stomach" or, more daringly, "the inward parts" and cleaned up many a spot of bother such as a bit of prolapse or a tumour or the various kinds of leakiness which showed that the aforementioned "inward parts" were "weak." Somehow or other it ceased being a

"cure" and sank to the level of a "remedy" but even in this attenuated form it still worked wonders for the advertisements proclaimed that out of every hundred users ninety-eight found it the next best thing to the Elixir of Life. Thus Lydia, operating in a different way, carried on the tradition of Sir Lancelot and Amadis de Gaul in bringing relief and happiness to distressed maidens and suffering dowagers. Indeed, its virtues are even greater than are claimed, for I recall a gentleman telling me that he had cured himself of diabetes by using the famous compound. This incidentally raises the question whether or not this person was one of those peculiar individuals whose endocrines, suffering from a sort of physiological "folie de doute" cannot make up their minds with which sex to endow their possessor.

Our concern, however, is not with the fair Lydia but with the gentleman to whom she gave her heart and hand and whose name she made famous. I have sometimes, in very idle moments, allowed my thoughts to turn to the circumstances of his demise, or rather to the probable circumstances for I have no certain information upon the matter. Yet I feel sure that skillets and pharmacological experiments must have played a part. Indeed all that one need do to reconstruct the scene is to imagine himself coming home each evening tired and hungry only to find the kitchen stove covered with stew-pans filled with messes designed to assuage not the physiological, supra-umbilical discomforts of a hungry husband but the pathological, infra-umbilical gnawings of dysmenorrhoeic neighbours. You can just see Percy rubbing his hands and coming through to the kitchen where Lydia is hard at work. "Well, Bright-eyes," he says, "what's cooking?" It didn't take him long to find out that there was nothing there for him. Now a man can stand only a certain amount of this sort of thing. Sooner or later it gets him down and then the first thing you know is that he is conducting pharmacological experiments of his own and doing things with raisins and yeast cakes. That, I think, is what happened in the case of Percy; and, as I imagine it, here is the last scene of all that ended Mr. Pinkham's strange eventful history. One night Percy was groping about in the cellar trying to remember where he had hidden his latest experiment when by accident he came upon a bottle of his wife's home brew instead and took a good swig of it. Immediately the leprous distillment coursed like lightning through all the natural gates and alleys of his body looking for a uterus into which to set its teeth and, being disappointed in not finding this necessary but unmasculine organ, it went completely berserk, reduced itself to atoms, split these atoms and blasted the

bewildered Percy into the nowhere out of here. This is not to be accepted as an authentic record of the deep damnation of his taking off but as a logical deduction from the few available facts. The moral is that ladies with a yen to fix up their neighbours' insides should leave the care of such intimate and intricate problems to the gynecologists. These may not be as good as the stuff you get in bottles but they are easier on the husbands.

J. C. R.

When Doctors Go on Strike

By M. J. Walsh

(Reprinted from June 15th, 1946, issue of Saturday Night, Toronto)

"The British Government is planning to nationalize the medical profession."—News Item.

Following is a news round-up which may be expected to appear in Great Britain on May 5, 1948, following the first full year after the nationalization of the health services.

London, May 4—A general strike of doctors, nurses, hospital employees, medical instrument makers and pharmaceutical workers, following failure of the Health Services Conciliation Board, appointed by the Prime Minister last January, to accomplish an accord in this vital labor dispute, has been set for June 1. The walkout, in brief, means that the sick and lame of the United Kingdom may have to seek attention outside these isles.

A last-minute roundup by Press Bureau in several cities shows the following discordant notes which have upset the one-time harmonious symphony of the health services:

Local 509, General Practitioners, Southminster Hospital, London, announce a deadlock in their battles against Local 105. Surgeon Specialists, originating in the claim that members of Local 105 frequently start major operations half an hour before the shift is due to go off duty, causing them to work excessive overtime. They also claim that members of Local 105 "swing the lead" when major appendectomies, etc., are slated for the operating rooms, staging "delaying actions" which necessitate this work being done by the following shift.

Local 927, Hospital Orderlies, St. Aphasas Hospital, Birmingham, will leave their posts tomorrow in protest against the action of a Surgeon Specialist in Eye, Ear and Throat officiating at an Emergency Ward operation for a car accident victim who suffered a broken leg. "A distinct violation of the Union over-all agreement which rules that specific work must only be done by the designated union," stated Alfred McCuddv, secretary-organizer of the Orderlies' Local 927. "This is the thin edge of the wedge

and, if not challenged by the medical men, will be challenged by us, as it could easily lead to such a retrograde step as our members being called upon, in emergencies, to operate lifts, wheel patients to and from the operating rooms, and similar duties assigned to other unions."

At Southwark a strike vote is to be taken Monday amongst the medical associates, in protest against the action of city police in calling out three brain surgeons to the train wreck in which fifteen persons were killed. It was pointed out that only members of the Surgeons' and General Practitioners' Locals had an agreement with the railway on whose lines the crash occurred.

Telephone officials on the Tweed border report that all doctors in that area have petitioned that their telephones be removed unless the County pay for them, contending that the 'phones are mainly used for official business.

The Medical Unions of the Highlands have announced that all members will be polled for their views on a two-shilling daily increase over their fellow members in the South of England—the Scots maintaining that the topography of their country makes covering their rounds a more arduous task than it is in more settled and civilized communities.

A walk-out is imminent in Aberdeen, following the application of Dr. Henry MacTavish, noted obstetrician, for an overtime allowance. According to union regulations, he is not required to officiate at more than eight births. Last Thursday, however, after presiding at seven, he was summoned to the delivery room of the General Hospital, where twin sons were born to Mrs. Robert McAndrew. Fellow-practitioners agree with him that he should be reimbursed for an increased daily quota.

Liverpool Nurses' Locals have agreed to stage a sit-down strike and have circularized the country, asking a sympathetic strike, in protest against the B.B.C.'s action in removing receiving sets from all hospital operating rooms. "We believe music assists the nurses to concentrate on the work in hand," stated Supervisor Janet Johnston. "During the war it was found that music sped up the work of munitions-making women. If music can aid in the work of death, why cannot it aid in the work of life?" she asked.

The Dover Medical Union voted this evening to walkout Monday in protest against the action

of hospital authorities in accepting deliveries of milk, butter and eggs from trucking concerns which are non-union.

The Home Secretary today announced that the appeal of Lloyd Treminster, sentenced to hang for the murder of his sweetheart, had been allowed. "The coroner at the inquest which decided the girl had been murdered had not paid up his union dues, he was, therefore, not a union member in good standing, and it follows that, as any act of his cannot have official sanction, no murder occurred officially," said the Home Secretary.

The Welsh Medical Association Choir has been outlawed by the National Medical Group for failure to charge union rates at a concert. The suspension dates from before last Christmas. "Tee-hee," chirps the current issue of Punch. "This means the Taffies have been all performing illegal operations for the past six months."



Northwestern District Medical Society

The Northwestern District Medical Society held its first meeting at Hamiota, June 26th, 1946.

Dr. J. L. Lamont spoke on the Care of Returned Men.

Dr. F. W. Jackson on Health Areas.

Dr. J. Wendell Macleod treated us to a splendid paper on Internal Medicine. A lively discussion followed.

Dinner was held at the Cecil Hotel.

Mrs. Hudson entertained the ladies.

E. D. Hudson.



Annual Meeting

Manitoba Medical Association

The attendance at this year's Annual Meeting should, if present indications are any criterion, surpass previous records. It is suggested that hotel reservations be made well in advance by applying directly to the Royal Alexandra Hotel, Winnipeg



Annual Meeting

Manitoba Health Officers' Association

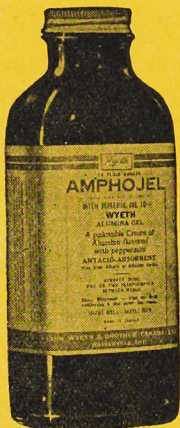
September 23, 1946

A detailed program will be sent to all Health Officers.





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Personal Notes and Social News

Dr. Michael Ranosky, recently demobilized from the R.C.A.M.C., has entered civilian practice as an associate of Dr. A. T. Gowron, 535 Somerset Building.

Dr. and Mrs. Menzies' (Morden, Man.) eldest daughter Mary Isabel was married on July 19th in Augustine United Church to Keith D. Deans, son of Mr. and Mrs. A. D. Deans of Winnipeg.

Dr. Maurice C. Gyde, of St. Pierre, Man., is engaged to marry Marjorie Matilda, elder daughter of Mr. and Mrs. G. B. McPherson, of St. Vital, Man. The wedding to take place August 24th, in Holy Cross Church, Norwood.

Dr. W. J. Grant of East Kildonan, Man., wishes to announce the engagement of his younger daughter, Jessica Alison, to Mr. John Francis Bongard, son of Mrs. Bongard and the late Mr. John Bongard of Toronto. The wedding to take place in Toronto in mid-August.

Dr. J. N. B. Crawford and family are leaving Winnipeg for Ottawa, Ont., where they will reside in the future. Dr. Crawford has been appointed Director of Medical Research, R.C.A.M.C., with headquarters in Ottawa.

Dr. Leonard Greenberg was married on July 11th to Rowena, only daughter of Mr. and Mrs. A. M. Peikoff, of Grandview, Man. The wedding took place in the Gold Room of the Royal Alexandra Hotel, Winnipeg.

Dr. Sveinbjorn Stefan Bjornson, only son of Dr. and Mrs. S. E. Bjornson of Ashern, Man., is engaged to marry Helga Norma, elder daughter of Mr. and Mrs. S. V. Sigurdson of Riverton, Man. The wedding to take place on August 15th, at Riverton.

Dr. and Mrs. Gerard Allison are happy to announce the birth of a daughter at the Winnipeg General Hospital on June 26th, 1946.

Dr. and Mrs. K. R. Trueman take pleasure in announcing the birth of a daughter on July 16th, 1946, at the Winnipeg General Hospital.

Dr. G. E. Colpitts is doing locum tenens for Dr. A. Blondal, who is convalescing from a recent illness.

Dr. I. Schulman, recently discharged from the R.C.A.M.C., has now entered civilian practice at Oak Lake, Man.

Dr. F. S. Macdonald, formerly with the R.C.A.M.C., has entered civilian practice as an associate with Dr. W. G. Beaton, at 616 Medical Arts Building.

"A Santa Barbara physician, Dr. Arthur Bruce Steele, was honored by the California State Tuberculosis and Health Association at its meeting in San Francisco, when he was elected president of the Trudeau Society, which is the medical section of the State Association.

Dr. Steele has been prominent in Santa Barbara in the field of diseases of the chest for the past 15 years, and has been a director of the County Tuberculosis and Health Association since 1939."—Santa Barbara News.

Dr. Steele was invalided from the First World War in 1918 and was a patient at the Sanatorium, Ninette. He began work at the Medical College here and finished at Stanford University, California. He was for two years at the Southern Pacific Hospital in San Francisco and since then has been practicing in Santa Barbara as a chest physician and later devoted all his time to chest surgery.

Dr. and Mrs. Steele and their two children spent a week in Winnipeg recently and visited his old friends at his former home in Hamiota, Man.

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8 drops; adults, 12 drops.

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Manitoba Medical Association

(Canadian Medical Association, Manitoba Division)

Annual Meeting, September 23, 24, 25, 26

Royal Alexandra Hotel, Winnipeg

Tentative Programme

(For detailed programme see September issue of Review)

The Canadian Medical Association is making arrangements for the following guest speakers to be present: Dr. Wallace Wilson, President of the C.M.A., and Dr. A. D. Kelly, Assistant Secretary, will also attend.

Visiting Speakers

Dr. J. A. MacMillan, Montreal, Ophthalmology.
Dr. J. A. Dauphinee, Toronto, Internal Medicine.
Dr. Roy Huggard, Vancouver, Surgery and Cancer.

Sunday, September 22nd

Evening

8.00 Executive Meeting.

Monday, September 23rd

Morning

9.00 Winnipeg General Hospital: Clinics.
12.00 Registration: Royal Alexandra Hotel.
12.30 Luncheon (Guest Speaker):
Royal Alexandra Hotel.

Afternoon

2.15 Scientific Programme: Guest Speakers.
6.30 President's Dinner to Executive.

Tuesday, September 24th

Morning

9.00 Business Session
Voting by Ballot (Until Thursday Noon).
12.30 Luncheon (Guest Speaker):
Royal Alexandra Hotel.

Afternoon

2.00 Business Meeting.

Evening

8.00 Business Meeting.

Wednesday, September 25th

Morning

9.00 St. Boniface Hospital: Clinics.
12.30 Luncheon (Guest Speaker):
Royal Alexandra Hotel.

Afternoon

2.15 Scientific Programme.

Evening

8.15 Public Meeting: Cancer Control

Thursday, September 26th

Morning

9.00 Deer Lodge Hospital: Clinics.

Afternoon

1.30 Golf Tournament.

Evening

7.00 Annual Dinner and Dance.



Members of the Association who have any material, scientific or otherwise, which they would like to present should communicate with the Chairman of the Scientific Programme Committee, Manitoba Medical Association, 510 Medical Arts Building, Winnipeg.

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IT IS A NEW TREATMENT in that emphasis is placed not on the use of Amino acids only—but upon the *protection* of the ulcer from gastric juices with a subsequent *healing* of the lesion.

Certain basic principles of peptic ulcer therapy have been common knowledge in the medical profession for years—but a totally *new application* of them is made in ULCAP THERAPY.

Clinical reports on ULCAPS have interested the medical profession to an extent that in itself is significant. Write for your own copy of the 36-page booklet *PEPTIC ULCER ACID THERAPY*—a documented study with case histories including roentgenological evidence.



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Department of Health and Public Welfare

Comparisons Communicable Diseases — Manitoba (Whites and Indians)

DISEASES	1946		1945		TOTALS	
	May 19 to June 15	Apr. 21 to May 18	May 20 to June 16	Apr. 22 to May 19	Jan. 1 to June 15, '46	Jan. 1 to June 16, '45
Anterior Poliomyelitis	---	---	1	3	2	9
Chickenpox	110	72	240	209	638	1300
Diphtheria	10	10	13	12	91	154
Diphtheria Carriers	2	---	2	1	9	24
Dysentery—Amoebic	---	---	---	---	1	---
Dysentery—Bacillary	---	---	4	---	1	6
Erysipelas	4	4	2	1	43	29
Encephalitis	---	---	1	1	---	3
Influenza	---	10	18	19	146	134
Measles	377	172	127	84	691	399
Measles—German	---	1	11	6	12	28
Meningococcal Meningitis	---	2	1	---	9	10
Mumps	296	312	187	160	1602	1004
Ophthalmia Neonatorum	---	---	---	---	---	---
Pneumonia—Lobar	6	6	16	16	80	85
Puerperal Fever	---	---	---	1	1	1
Scarlet Fever	50	27	56	46	324	411
Septic Sore Throat	---	1	4	2	20	14
Smallpox	---	---	---	---	---	---
Tetanus	1	---	---	---	1	---
Trachoma	1	---	---	---	1	---
Tuberculosis	72	84	70	67	419	294
Typhoid Fever	---	2	1	---	8	27
Typhoid Paratyphoid	---	---	1	---	---	3
Typhoid Carriers	---	---	---	---	2	2
Undulant Fever	---	1	1	3	7	8
Whooping Cough	10	32	60	20	151	209
Gonorrhoea	152	208	182	114	1115	834
Syphilis	57	47	42	30	330	280
Diarrhoea and Enteritis, under 1 yr.	14	4	1	---	71	2

DEATHS FROM COMMUNICABLE DISEASES

For the Month of May, 1946

Urban—Cancer, 39; Influenza, 1; Pneumonia Lobar, 1; Pneumonia (other forms), 8; Syphilis, 3; Tuberculosis, 8; Hodgkins' Disease, 1; Disease of Pharynx and Tonsils, 1; Gonococcus Infection, 1; Diarrhoea and Enteritis, 5. Deaths under 1 year, 26. Deaths over 1 year, 156. Stillbirths, 10.

Rural—Cancer, 26; Influenza, 4; Pneumonia Lobar, 3; Pneumonia (other forms), 8; Syphilis, 1; Tuberculosis, 12; Disease of Pharynx and Tonsils, 2; Diarrhoea and Enteritis, 2; Mumps, 1. Deaths under 1 year, 19. Deaths over 1 year, 145. Stillbirths, 16.

Indians—Tuberculosis, 6; Whooping Cough, 1; Disease of Pharynx and Tonsils, 1. Deaths under 1 year, 3. Deaths over 1 year, 7. Stillbirths, 2.



Diarrhoea and Enteritis under one year—Fourteen cases have been reported in this period. Most of these are from the City of Winnipeg. No doubt there have been many cases which have not been reported as there have been eleven deaths. Careful check should be kept on pasteurization of milk, safe water and good refrigeration, especially for infants' foods.

Measles is becoming conspicuous by its numbers. We are probably experiencing the start of an epidemic. Infants should be kept from exposure.

Mumps—Although still prevalent shows some decline in this four-week period.

Tetanus—With one case which died, shows how serious this infection may be. All persons receiving injuries which may be infected by soil should receive tetanus antitoxin as a prophylactic.

DISEASES	(White Cases Only)				
	*732,000 Manitoba	*3,825,000 Ontario	*906,000 Saskatchewan	*2,972,000 Minnesota	*641,000 North Dakota
Anterior Poliomyelitis	---	1	---	8	---
Chickenpox	110	1,590	146	---	12
Diarrhoea and Enteritis, under one year	14	---	---	2	---
Diphtheria	10	26	4	34	2
Diphtheria Carriers	2	---	1	---	---
Dysentery—Amoebic	---	4	---	8	---
Dysentery—Bacillary	---	---	---	---	---
Encephalitis—Epidemica	---	---	---	---	---
Erysipelas	4	3	---	---	---
Influenza	---	8	5	2	17
Jaundice—Infectious	---	12	---	---	---
Malaria	---	---	---	2	---
Measles	377	3,386	141	330	43
Measles—German	---	123	7	---	---
Meningococcal Meningitis	---	4	---	12	1
Mumps	296	1,483	151	---	---
Pneumonia	6	---	---	---	55
Scarlet Fever	50	237	8	191	10
Septic Sore Throat	---	7	2	---	---
Smallpox	---	---	---	1	---
Trachoma	1	---	---	---	---
Tuberculosis	72	179	79	20	20
Tularemia	---	---	---	1	---
Typhoid Fever	---	3	1	---	2
Typhoid Fever Carriers	---	1	---	---	---
Typhoid Paratyphoid	---	1	---	1	---
Undulant Fever	---	12	---	9	1
Whooping Cough	10	381	1	39	2
Gonorrhoea	152	465	---	---	27
Syphilis	57	356	---	---	17

*Approximate population.

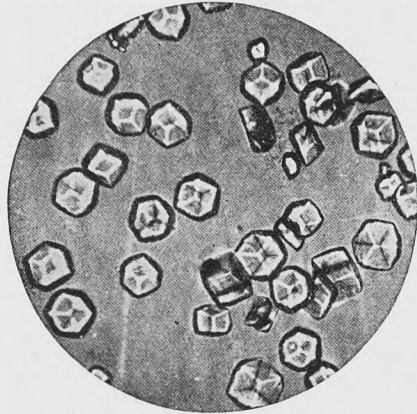
INSULIN

TWENTY-FIFTH ANNIVERSARY

The twenty-fifth anniversary of the discovery of Insulin will be marked by the American Diabetes Association at its meeting in Toronto on 16th, 17th and 18th September, 1946.

The discovery of Insulin by Banting and Best, working at the University of Toronto, introduced a new era in the treatment of diabetes mellitus and a new chapter in physiological research.

From the commencement of the supply of Insulin, the Connaught Medical Research Laboratories have been responsible for its preparation in Canada and have carried on related research problems. Of special interest was the work of Dr. D. A. Scott who discovered the necessary conditions for the preparation of crystalline forms of Insulin. All unmodified Insulin regularly distributed by the Laboratories is highly purified material of crystalline origin.



PHOTOMICROGRAPH OF ZINC-INSULIN CRYSTALS

Through research conducted at the Laboratories by Scott and Fisher, discoveries of Hagedorn and his colleagues in Denmark were extended, resulting in the preparation of Protamine Zinc Insulin. This product provides an effective means of treatment for patients requiring a more prolonged blood-sugar-lowering effect than that resulting from the administration of unmodified Insulin.

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College of Physicians and Surgeons of Manitoba

Registration Committee

Winnipeg, Man., May 15th, 1946.

A meeting of the Registration Committee was held on Wednesday, May 15th, 1946.

Present: Drs. T. D. Wheeler, Wm. Turnbull and W. G. Campbell.

1. Consideration of the Application for Registration of Dr. Frederick Theodore Dennis.

Dr. Dennis is a graduate from the University of Toronto in 1943, and is licensed with the Medical Council of Canada the same year. A Basic Science Certificate accompanied his application.

Motion:

Moved by Dr. T. Digby Wheeler, Seconded by Dr. Wm. Turnbull: "THAT Dr. Frederick Theodore Dennis' application for registration be accepted." Carried.

2. Consideration of the Application for an Enabling Certificate from Dr. Bradford Ezra Steiner.

Dr. Steiner graduated from Wheaton College, Wheaton, Illinois, with a B.Sc. degree in 1936. He received his M.D. degree from the University of Illinois College of Medicine in 1943. He was accepted as a Diplomate of the National Board of Medical Examiners in 1944.

Motion:

Moved by Dr. T. Digby Wheeler, Seconded by Dr. Wm. Turnbull: "THAT an enabling certificate be granted to Dr. Bradford Ezra Steiner." Carried.

3. Consideration of the Application for Registration of Dr. Philip Goldstein.

Dr. Goldstein graduated from the University of Saskatchewan in 1937 with a B.A. degree, and received his M.D., C.M., from Queen's University in 1941. He is licensed with the Medical Council of Canada in 1941. A Basic Science Certificate accompanied his application.

Motion:

Moved by Dr. T. Digby Wheeler, Seconded by Dr. Wm. Turnbull: "THAT Dr. Philip Goldstein's application for registration be accepted." Carried.

Registration Committee

Winnipeg, Man., May 23rd, 1946.

A meeting of the Registration Committee was held on Thursday, May 23rd, 1946.

Present: Drs. T. D. Wheeler, Wm. Turnbull and W. G. Campbell.

1. Consideration of the Application for Registration of Dr. Alastair Douglas Maclean.

Dr. Maclean graduated from the University of Manitoba in 1940 with a B.Sc. degree, and received his M.D., C.M., from Queen's University in 1944. He is licensed with the Medical Council of Canada in 1944. A Basic Science Certificate accompanied his application.

Motion:

Moved by Dr. T. Digby Wheeler, Seconded by Dr. Wm. Turnbull: "THAT Dr. Alastair Douglas Maclean's application for registration be accepted." Carried.

2. Consideration of the Application for Registration of Dr. Erwin Gregory Hawes.

Dr. Hawes graduated from the University of Saskatchewan in 1940 with a B.A. degree, and received his M.D. from the University of Toronto in 1943. He is licensed with the Medical Council of Canada in 1943. A Basic Science Certificate accompanied his application.

Motion:

Moved by Dr. T. Digby Wheeler, Seconded by Dr. Wm. Turnbull: "THAT Dr. Erwin Gregory Hawes' application for registration be accepted." Carried.

Polio Precautions: Department of Health and Public Welfare

Through the summer months and into September the threat of outbreaks of infantile paralysis is most ominous. A bulletin outlining preventive measures entitled "When Polio Strikes," has been prepared by the National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N.Y.

Here are some of the general precautions to be observed:

1. Avoid overtiring and extreme fatigue from strenuous exercises.

2. Avoid sudden chilling such as would come from a plunge into extremely cold water on a very hot day.

3. Pay careful attention to personal cleanliness, such as thorough hand-washing before eating. Hygienic habits should always be observed.

4. If possible avoid tonsil and adenoid opera-

tions during epidemics. Careful study has shown that such operations, when done during an epidemic, tend to increase the danger of contracting infantile paralysis in its most serious form.

5. Use the purest milk and water you can. Keep flies away from food. While the exact means of spread of the disease is not known, contaminated water and milk are always dangerous and flies have repeatedly been shown to carry the infantile paralysis virus.

6. Do not swim in polluted water.

7. Maintain community sanitation at a high level at all times.

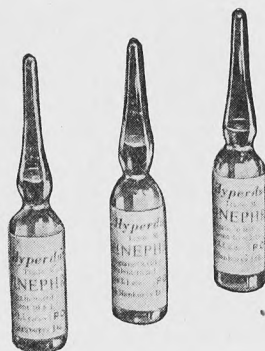
8. Avoid all unnecessary contact with persons with any illness suspicious of infantile paralysis.

August, 1945, Vol. VI, No. 8, Journal of the American Pharmaceutical Association.

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FOR PROLONGED ACTION

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Morphine, gr. $\frac{1}{4}$, hyoscine, gr. $\frac{1}{80}$, epinephrine, gr. $\frac{1}{160}$, (as mucates) per c.c. Produces amnesia and narcosis for about 8 hours, without fall of blood-pressure.

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1 in 1000 (as mucate). Gives relief for 8 to 10 hours in bronchial asthma.

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Morphine, gr $\frac{1}{2}$ (as mucate) per c.c. Relieves pain for 8 to 12 hours.

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The following doctors have been discharged from the services and are now back in practice.

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Adamson, Dr. Gilbert L., Winnipeg Clinic, Winnipeg		97 284
Adamson, Dr. J. D., Winnipeg General Hospital		87 681
Alexander, Dr. Walter, 214 Medical Arts Bldg., Wpg.		95 300
Allen, Dr. C. S., 216 Panama Court, Winnipeg		41 185
Anderson, Dr. Julius, 185 Maryland St., Winnipeg		404 065
Austman, Dr. K. J., 704 McArthur Bldg., Winnipeg		95 826
Avren, Dr. S. S., 416 McKenzie St., Winnipeg		59 422
Baldry, Dr. Geo. S., 616 Medical Arts Bldg., Wpg.		94 980
Barrie, Dr. J. G., 11 Rosewarne Ave., St. Vital		204 643
Beamish, Dr. R. E., 216 Medical Arts Bldg., Winnipeg		94 354
Beckstead, Dr. J. L., 619 Arlington St., Winnipeg		36 272
Bellan, Dr. S., 400 Aberdeen Ave., Winnipeg		54 679
Bell, Dr. P. G., Deer Lodge Hospital, Winnipeg		62 821
Bennett, Dr. Wm. J., 12 Newhaven Apts., Winnipeg		33 772
Benoit, Dr. C. F., 114 Claremont Ave., Norwood		202 470
Berger, Dr. M., 428 Anderson Ave., Winnipeg		58 345
Berbrayer, Dr. Peter, 205 Boyd Bldg., Winnipeg		94 112
Berger, Dr. M., 428 Anderson Ave., Winnipeg		
Black, Dr. Geo. M., 325 Washington Ave., Winnipeg		503 054
Bleeks, Dr. Cherry K., 105 Medical Arts Bldg., Wpg.		93 273
Bottomley, Dr. H. W., Winnipeg Clinic, Winnipeg		97 284
Boyd, Dr. Wm. J., 1012 Ingersoll St., Winnipeg		24 427
Brotman, Dr. E. H., 1137 Portage Ave., Winnipeg		36 500
Brown, Dr. M. M., 508 Medical Arts Bldg., Winnipeg		93 889
Bruce, Dr. J. D., 20 Buckingham Apts., Winnipeg		96 780
Burch, Dr. J. E., Winnipeg Clinic, Winnipeg		97 284
Bruser, Dr. D. M., 58 Noble Ave., Winnipeg		
Cadham, Dr. R. G., City Hall, Winnipeg		849 122
Carleton, Dr. M., 603 Boyd Bldg., Winnipeg		94 763
Chestnut, Dr. H. W., 25 Knappen Ave., Winnipeg		
Clark, Dr. C. W., 216 Medical Arts Bldg., Winnipeg		94 354
Cohen, Dr. Harvey, 153 Cathedral Ave., Winnipeg		56 007
Cohen, Dr. R., 600 Boyd Bldg., Winnipeg		93 275
Coke, Dr. L. R., 238 Spence St., Winnipeg		
Collins, Dr. D. R., Internes' Quarters, Winnipeg General Hospital, Winnipeg		87 681
Colpitts, Dr. Grant E., 602 Medical Arts Bldg., Wpg.		93 996
Cooper, Dr. Ross H., 212 Medical Arts Bldg., Winnipeg		93 103
Corrigan, Dr. C. E., 307 Waterloo St., Winnipeg		401 271
Cram, Dr. J. B., 409 Power Bldg., Winnipeg		95 165
Croll, Dr. L. D., 661 Broadway, Winnipeg		72 138
Daniel, Dr. E., Winnipeg General Hosp., Winnipeg		87 681
Davidson, Dr. Kenneth, 6 Medical Arts Bldg., Wpg.		95 683
Davidson, Dr. A. M., 6 Medical Arts Bldg., Winnipeg		95 683
Decter, Dr. P. H., 283 Magnus Ave., Winnipeg		59 183
Dennis, Dr. F. T., Deer Lodge Hospital, Winnipeg		64 861
Doupe, Dr. J., 592 Stradbroke Ave., Winnipeg		46 501
Downey, Dr. J. L., 333 Bartlett Ave., Winnipeg		46 751
Easton, Dr. S., 216-7 Curry Bldg., Winnipeg		26 477
Edwards, Dr. K. N., 139 Girton Boulevard	Tuxedo, Man.	
Elliott, Dr. M. R., 140 Lawndale Ave., Norwood		204 394
Elvin, Dr. Norman L., 314 Medical Arts Bldg., Wpg.		95 317
Eshoo, Dr. H., Misericordia Hospital, Winnipeg		37 035
Evooy, Dr. G. H., 264 Edmonton St., Winnipeg		94 335
Fahrni, Dr. Gordon S., 105 Medical Arts Bldg., Wpg.		93 273
Fairfield, Dr. G. C., Portage la Prairie, Man.		
Feldsted, Dr. E. T., 602 Medical Arts Bldg., Winnipeg		93 996
Feinstein, Dr. M. S., 72 Harrow St., Winnipeg		46 001
Flett, Dr. R. O., 293 Medical Arts Bldg., Winnipeg		92 934
Franks, Dr. Fred, 402 Mountain Ave., Winnipeg		
Fryer, Dr. A. I., 5 Gloucester Apts., Winnipeg		30 576
Furman, Dr. M. J., 463 Ash St., Winnipeg		403 505
Galloway, Dr. G. D., 74 St. Mary's Rd., Norwood		
Gordon, Dr. Athol R., 505 Medical Arts Bldg., Wpg.		96 232
Govan, Dr. W. R., Abbott Clinic, 409 Power Bldg., Winnipeg		95 165
Green, Dr. P. T., 201 Hampton St., St. James, Man.		61 622
Guest, Dr. W. C., 151 Yale Ave., Winnipeg		

Gyde, Dr. M. C., St. Pierre, Man.	
Hall, Dr. C. W., 1328 Pembina Highway, Fort Garry, Man.	49 498
Hamilton, Dr. Glen F., 408 Medical Arts Bldg., Wpg.	93 846
Hart, Dr. W. J., 185 Kelvin St., Winnipeg	
Hastings, Dr. D. J., 634 Somerset Bldg., Winnipeg	98 727
Hayter, Dr. F. W., Deer Lodge Hospital, Winnipeg	64 861
Helgason, Dr. R. E., Glenboro, Man.	
Henneberg, Dr. C. C., 302 Medical Arts Bldg., Wpg.	92 710
Hillsman, Dr. J. A., 308 Medical Arts Bldg., Winnipeg	97 329
Hitesman, Dr. R. J., 512 Medical Arts Bldg., Wpg.	94 808
Holland, Dr. T. E., 203 Medical Arts Bldg., Winnipeg	96 948
Homik, Dr. A. M., 612 Cathedral Ave., Winnipeg	
Houston, Dr. A. B., 937 Warsaw Ave., Winnipeg	45 925
Hudson, Dr. J. E., Hamiota, Man.	
Hunter, Dr. H. B. M., Deer Lodge Hospital, Winnipeg	64 861
Israels, Dr. S., 701 Boyd Bldg., Winnipeg	97 223
Jacks, Dr. Q. D., 410 Medical Arts Bldg., Winnipeg	95 309
Jauvoish, Dr. S., 206 Boyd Bldg., Winnipeg	93 240
Jones, Dr. E. A., Ste. 5, 117 Bryce St., Winnipeg	43 283
Kasian, Dr. P., St. Joseph's Hospital, Winnipeg	57 211
Kiernan, Dr. M. K., Winnipeg Gen. Hosp., Winnipeg	87 681
Kilgour, Dr. J. M., Winnipeg Clinic, Winnipeg	97 284
Kippen, Dr. D. L., 188 Home St., Winnipeg	35 987
Klass, Dr. A. A., 132 Matheson Ave., Winnipeg	55 022
Kobrinsky, Dr. M. T., 968 Strathcona St., Winnipeg	71 498
Kobrinsky, Dr. Sam, 602 Medical Arts Bldg., Wpg.	95 875
Kobrinsky, Dr. Sydney, 505 Boyd Bldg., Winnipeg	93 912
Lansdown, Dr. L. P., Pine Falls, Man.	
Lazareck, Dr. T. L., 616 Aberdeen Ave., Winnipeg	53 674
Leach, Dr. W. B., 150 Alloway Ave., Winnipeg	71 921
Lebbetter, Dr. T. A., Winnipeg Clinic, Winnipeg	97 284
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Lund, Dr. P. C., Deer Lodge Hospital, Winnipeg	62 821
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Maclean, Dr. Ian S., Winnipeg Clinic, Winnipeg	97 284
MacLeod, Dr. J. W., Winnipeg Clinic, Winnipeg	97 284
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MacNeil, Dr. Robt. W., Children's Hospital, Wpg.	57 031
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Marmar, Dr. M., 265 Flora Ave., Winnipeg	55 131
Margolese, Dr. J., 414 Boyd Bldg., Winnipeg	24 541
Martin, Dr. J. H., St. Boniface Hospital, St. Boniface, Man.	201 121
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McIntyre, Dr. Donald N. C., 303 Med. Arts Bldg., Wpg.	92 639
McKenty, Dr. J. Stewart, 514 Med. Arts Bldg., Wpg.	92 711
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McKenty, Dr. V. J., 205 Boyd Bldg., Winnipeg	94 112
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McNicol, Dr. H. L., Deer Lodge Hospital, Winnipeg	62 821
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McPhail, Dr. Ethel M., 90 Roslyn Road, Winnipeg	
McTavish, Dr. Geo. B., 206 Affleck Block, Winnipeg	98 620
Medovy, Dr. Harry, 401 Boyd Bldg., Winnipeg	93 849
Miller, Dr. I., St. Boniface Hosp., St. Boniface	201 121
Mitchell, Dr. J. R., Ste. 10 Fairhaven Apts., Winnipeg	72 187
Moffat, Dr. R. G., 340 Borebank St., Winnipeg	404 192
Moir, Dr. J. H., 41 Springside Ave., St. Vital, Man.	205 543
Moore, Dr. C. H., 116 Medical Arts Bldg., Winnipeg	97 706
Myers, Dr. R. F. M., 15 Clement Block, Brandon, Man.	
Natsuk, Dr. A. W., 75 Sherbrook St., Winnipeg	36 821

Neilson, Dr. Clive, 404 Medical Arts Bldg., Winnipeg	94 041
Orchard, Dr. S. A., St. Boniface Hosp., St. Boniface	201 121
Perrin, Dr. M. B., Winnipeg Clinic, Winnipeg	97 284
Pickard, Dr. E. W., 118 Lenore St., Winnipeg	
Pierce, Dr. M. M., 354 Stella Ave., Winnipeg	54 134
Rabson, Dr. L. R., 452 Ash St., Winnipeg	
Rafuse, Dr. E. R., 320 Sherbrook St., Winnipeg	
Ramsay, Dr. F. G., 378 Borebank St., Winnipeg	402 669
Revell, Dr. D. G., Winnipeg General Hospital, Wpg.	87 681
Richardson, Dr. R. W., 105 Medical Arts Bldg., Wpg.	93 273
Ridge, Dr. J. M., Clearwater Indian Hospital, The Pas, Man.	
Riley, Dr. H. W., Winnipeg Clinic, Winnipeg	97 284
Rose, Dr. J. E., Winnipeg Gen. Hosp., Winnipeg	87 681
Rosenfield, Dr. V. L., 405 Avenue Bldg., Winnipeg	97 141
Rumball, Dr. A. C., Deer Lodge Hospital, Winnipeg	62 821
Rusen, Dr. S. D., 399 Machray Ave., Winnipeg	58 474
Rutherford, Dr. W. G., 695 Wolseley Ave., Winnipeg	33 569
Ryan, Dr. George H., Winnipeg Clinic, Winnipeg	97 284
Sandborn, Dr. B. S. E., Grace Hospital, Winnipeg	37 271
Scarrow, Dr. Hart G., Deer Lodge Hosp., Winnipeg	64 861
Schoemperlen, Dr. C. B., 216 Medical Arts Bldg., Wpg.	94 354
Shaver, Dr. W. A., 596 Spruce St., Winnipeg	
Smith, Dr. N. S. H., 275 Duffield St., St. James	63 224
Smith, Dr. F. Hartley, 86 Tache Ave., Norwood, Man.	203 993
Sommerville, Dr. A. N., 614 St. Mary's Rd., St. Vital	202 411
Sommerville, Dr. A. N., 614 St. Mary's Rd., St. Vital	
Stephens, Dr. Gordon M., 635 Henderson Hy., Wpg.	503 965
Stephenson, Dr. Earl, 409 Power Bldg., Winnipeg	95 165
Stewart, Dr. D. B., 30 Ferndale Ave., Norwood, Man.	205 298
Swartz, Dr. David, 303 Medical Arts Bldg., Winnipeg	92 639
Swan, Dr. A. J., 303 Medical Arts Bldg., Winnipeg	97 005
Swan, Dr. R. S., 215 Medical Arts Bldg., Winnipeg	94 354
Tanner, Dr. A. R., 310 Medical Arts Bldg., Winnipeg	95 946
Taylor, Dr. C. H., 606 Boyd Bldg., Winnipeg	98 937
Taylor, Dr. J. R., 6B Chelsea Court, Winnipeg	
Tisdale, Dr. Paul K., Deer Lodge Hospital, Winnipeg	62 821
Valsrub, Dr. Samuel, 310 Redwood Ave., Winnipeg	
Wakefield, Dr. G. E., Ste. 1, 270 Roslyn Rd., Winnipeg	44 889
Walton, Dr. C. H. A., Winnipeg Clinic, Winnipeg	97 284
Walton, Dr. Fred A., 3 Locarno Apts., Winnipeg	45 719
Whepley, Dr. E. H., 586 Ingersoll St., Winnipeg	39 061
White, Dr. O. J., Winnipeg General Hosp., Winnipeg	87 681
Whiteford, Dr. J. W., 520 Medical Arts Bldg., Wpg.	92 920
Whitehead, Dr. Robt. G. D., 91 Maryland St., Wpg.	
Willows, Dr. R. L., St. Boniface Hosp., St. Boniface	201 121
Wilt, Dr. J. C., Winnipeg Gen. Hosp., Winnipeg	87 681
Winram, Dr. R. G., Ste. 51 Roslyn Apts., Winnipeg	
Brokovski, Dr. T. W.	Brandon, Man.
Brook, Dr. Joseph	Beausejour, Man.
Bissett, Dr. E. D. R.	Pine Falls, Man.
Brownlee, Dr. T. I.	Russell, Man.
Corbett, Dr. Connor A.	Crystal City, Man.
Crawford, Dr. C. S.	The Pas, Man.
Davidson, Dr. D. A.	Cartwright, Man.
Dick, Dr. C. J. W.	Hodgson, Man.
Edmison, Dr. J. N., Manitoba Sanatorium	Ninette, Man.
Fiddes, Dr. G. W. J.	Brandon, Man.
Findlay, Dr. J. A.	Brandon, Man.
Gendreau, Dr. L. P., Mental Hospital	Selkirk, Man.
Goldstein, Dr. P.	Benito, Man.
Harris, Dr. R. S.	Viriden, Man.
Hawes, Dr. E. G.	Brandon, Man.
Hebert, Dr. J. L.	Lorette, Man.
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